SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1967

NO. 950

BROTHERHOOD OF LOCOMOTIVE FIREMEN & ENGINEMEN, ET AL., Appellants,

vs.

CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD COMPANY, ET AL.

NO. 973

ROBERT N. HARDIN, PROSECUTING ATTORNEY FOR THE SEVENTH JUDICIAL CIRCUIT OF ARKANSAS, ETC., ET AL., Appellants,

vs.

CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD COMPANY, ET AL.

APPEALS FROM THE UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF ARKANSAS

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In the
UNITED STATES DISTRICT COURT
For the Western District of Arkansas,
Hot Springs Division.

Civil No. 944.

CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD COMPANY, THE KANSAS CITY SOUTHERN RAILWAY CO., MISSOURI PACIFIC RAILROAD COMPANY, ST. LOUIS-SAN FRANCISCO RAILWAY CO., ST. LOUIS SOUTHWESTERN RAILWAY COMPANY, and THE TEXAS AND PACIFIC RAILWAY COMPANY,

Plaintiffs,

vs.

LAWSON E. GLOVER, Prosecuting Attorney for the Seventh Judicial Circuit of Arkansas, and JOHN W. GOODSON, Prosecuting Attorney for the Eighth Judicial Circuit of Arkansas,

Defendants.

COMPLAINT.

(Filed April 10, 1964.)

For their Complaint plaintiffs allege:

1.

The jurisdiction of this Court is invoked pursuant to Title 28, United States Code, Section 1331. The matter in controversy herein exceeds the sum or value of $10,000, exclusive of interest and costs, and arises under the Con-

stitution and laws of the United States, to-wit: The due process and equal protection clauses of the Fourteenth Amendment to the United States Constitution; Article I, Section 8, Clause 3 of the United States Constitution known as the Commerce Clause; Article VI, Section 2 of the United States Constitution known as the Supremacy Clause; Public Law 88-108 and the award of the Arbitration Board No. 282 pursuant thereto, established by Joint Resolution of Congress and approved August 28, 1963; and the Railway Labor Act, Title 45, United States Code, Sections 151 et seq.

2.

The jurisdiction of this Court is also invoked pursuant to Title 28, United States Code, Sections 2281-2284, this being an action for an injunction against the enforcement of statutes of the State of Arkansas, to-wit: Act 116 of the Acts of Arkansas of 1907 (Ark. Stats. 73-720, 73-721 and 73-722) and Act 67 of the Acts of Arkansas of 1913 (Ark. Stats. 73-726, 73-727, 73-728 and 73-729).

3.

The jurisdiction of this Court is also invoked pursuant to Title 28, United States Code, Sections 1332 and 2201 and 2202. The matter in controversy herein exceeds the sum or value of $10,000, exclusive of interest and costs, the plaintiffs are all corporations organized and existing under and by virtue of the laws of states other than Arkansas, and all having their principal place of business in states other than Arkansas, and all defendants are citizens and residents of the State of Arkansas. There is an actual justiciable controversy between these parties hereinafter described.

4.

Plaintiffs, at all times pertinent hereto, have been, and now are, common carriers, engaged in the transportation of

property in interstate commerce over railroads which they own and operate in the State of Arkansas and numerous other states. Each plaintiff owns and operates lines more than one hundred miles in length, regularly operates freight trains in Arkansas consisting of over twenty-five cars, and regularly conducts switching operations in cities of the first and second class across public crossings. Plaintiffs are therefore subject to the Acts of the State of Arkansas referred to in Paragraph 2 herein, and reproduced in full in Exhibits "A" and "B" hereto. Total railroad trackage in the State of Arkansas is appproximately 4,000 miles, of which plaintiffs own and operate in excess of 3,500 miles. Each plaintiff is a "Class I" railroad as classified by the Interstate Commerce Commission, and subject to Part I. of the Interstate Commerce Act (49 U.S.C. §1, et seq.).

5.

Defendants Lawson E. Glover and John W. Goodson are the duly elected, qualified and acting Prosecuting Attorneys for the Seventh and Eighth Circuits of Arkansas, respectively, and as such are charged by law and oath of office to enforce all of the criminal statutes of the State of Arkansas including Exhibits "A" and "B". Defendants each are residents of the Western District of Arkansas, and their Judicial Circuits are located in said District. Each plaintiff regularly conducts railroad operations within the Judicial Circuit of one or both defendants which, if not conducted with the number of personnel prescribed in Exhibits "A" and "B", would constitute a violation of those Acts. Defendants, by virtue of the duties imposed upon them by law, and by virtue of their oaths of office, threaten to enforce the penalties of these Acts, and will, unless restrained by this Court, enforce these penalties of these void and unconstitutional statutes by bringing multiple actions against plaintiffs.

6.

As applied to these plaintiffs, these Acts are in violation of the due process clause of the Fourteenth Amendment to the United States Constitution in that they are arbitrary, capricious, discriminatory and unreasonable in their operation and bear no reasonable relationship to the purported purpose of safety to employees and the public. The effect of these laws is to require plaintiffs to employ unnecessary firemen and brakemen on freight trains, and unnecessary firemen and switchmen in switch crews, who either have no duties to perform, or whose duties could be performed with at least equal safety by other members of the train and switch crews. The cost of employment of these unnecessary employees in Arkansas during the year 1962 to the plaintiffs was in excess of $6,000,000.

This cost of compliance with these laws during 1962 is typical of the cost so incurred by plaintiffs for some years past in this respect, and of the cost that they are now being required to bear. This burden is imposed upon plaintiffs without any corresponding benefit being obtained that could sustain the Acts as a legitimate exercise of the police power.

7.

As applied to these plaintiffs, these Acts are in violation of the equal protection clause of the Fourteenth Amendment to the United States Constitution in that they single out the railroad industry in the State of Arkansas, of which plaintiffs are a part, and impose by statute upon it alone, arbitrary, inflexible requirements as to the minimum number of employees which must be assigned in its business as therein provided. No other industry in the State of Arkansas is so burdened. Competing forms of transportation in the State are favored thereby. Act 116 of 1907 exempts railroads with less than 50 miles of line, and Act 67 of 1913 exempts railroads with less than 100 miles of

line. All plaintiffs operate railroads of more than 100 miles of line, but there are other rail carriers in Arkansas with less than 100 miles of line, and still others with less than 50 miles of line. The exempted railroads operate in the same geographical areas as plaintiffs, with similar equipment and under similar conditions. The Acts, by subjecting plaintiffs to their rigid, onerous and burdensome requirements, to the advantage of other industries in the State of Arkansas, and especially competing forms of transportation, not so burdened, together with the classification excluding certain other railroads, are arbitrary, capricious, discriminatory and unreasonable and deny to plaintiffs the equal protection of the laws contrary to the equal protection clause of the Fourteenth Amendment to the Constitution of the United States.

8.

As applied to these plaintiffs, these Acts are in violation of Article I, Section 8, Clause 3 of the Constitution of the United States, known as the Commerce Clause, in that they impose upon plaintiffs' conduct of interstate commerce unreasonable and arbitrary requirements constituting a direct interference with, burden upon, and impediment of such commerce, and in that they greatly and unreasonably increase plaintiffs' operating costs within the State of Arkansas. The Acts therefore impair, for no legitimate purpose, the revenues of plaintiffs and their ability to supply the public with adequate, economical and efficient transportation services at reasonable rates, and are therefore contrary in their operation to the National Transportation Policy expressed in the Interstate Commerce Act, as amended in 1940 and 1958 (49 U.S.C., preceding §1). In addition to the financial burden imposed on plaintiffs by these Acts, they further operate to unduly and unreasonably burden interstate commerce in that some plaintiffs are required to stop or slow interstate trains at various

points entering and leaving the State of Arkansas for the sole purpose of loading or unloading employees who are unnecessary to the safe and efficient operation of these trains, and such interstate commerce is therefore unreasonably delayed.

9.

As applied to these plaintiffs, these Acts are further in violation of Article I, Section 8, Clause 3 of the Constitution of the United States in that they discriminate against interstate commerce in favor of local or intrastate commerce. Act 116 of 1907 applies only to plaintiffs and the other seven interstate railroads operating in Arkansas, because each of the twelve interstate railroads operating in Arkansas owns and operates in excess of 50 miles of line, and the Act exempts all sixteen of the intrastate railroads operating in Arkansas because each has less than 50 miles of line. Likewise, Act 67 of 1913 exempts all intrastate railroads and its burden falls only on plaintiffs and two other interstate railroads with at least 100 miles of line. This classification, by which these Acts apply to no intrastate railroad and by which the 1907 Act applies to all interstate railroads and the 1913 Act applies only to interstate railroads, constitutes a direct, substantial and discriminatory burden upon interstate commerce.

10.

In 1908 the Supreme Court of Arkansas held that there was sufficient evidence to support a legislative determination that Act 116 of 1907 promoted public and employee safety to prevent the Court from then saying that "the burden on the carrier is arbitrary and without any corresponding benefit to the public". *Chicago, Rock Island & Pacific Ry. Co. v. State,* 86 Ark. 412, 111 S.W. 456. The Supreme Court of the United States affirmed, holding the evidence to be sufficient to prevent it from then saying

"that it is so unreasonable as to justify the court in adjudging that it is merely an arbitrary exercise of power, and not germane to the objects which evidently the state legislature had in view." *Chicago, R. I. & P. Ry. Co. v. State of Arkansas,* 219 U. S. 453 (1911). The evidence, so considered sufficient by both courts, was testimony presented in the trial court on November 18, 1907 relating to the heavy duties performed by train crews and hazards to which they were exposed, at and prior to that time. The facts that the courts considered relevant support of the legislative determination (86 Ark. 419-420) were:

(a) Due to changes in equipment and methods of operation, much of the conductor's time was taken up with making his reports thereby preventing him from giving much time to the physical handling of the train;

(b) Due to increased car capacity, tonnage, number of cars in trains and increased engine power, there was increased amount of work for brakemen to do, although they were required to stop trains in emergencies only;

(c) It was a daily occurrence for drawheads to pull out, requiring the services of two, and frequently three, men to properly chain up the cars;

(d) That when a train was stopped between stations, it was required that a brakeman be sent to the rear of the train, and frequently required to send another forward, to flag approaching trains, and since safe operation and the rules of the company required the engineer and fireman to remain at their posts only the conductor was available to perform any required work on the train in this situation;

(e) Trains were frequently stopped at, or switched across, public crossings, and public safety often required posting signalmen at these crossings;

(f) In switching it was required that brakemen work the automatic couplers and the connection and disconnection of air hoses; and

(g) Some of the witnesses were of the opinion that switching could be done with greater safety to the train crew with three brakemen and that the efficiency of train and freight movements would be enhanced with less danger of accidents.

Due to technical advances and changes in methods of railroad operations, such of the above considerations as would tend to support the need of a six-man freight train crew either no longer exist, or the circumstances are so changed that in similar situations under modern conditions the presence of the "third" brakeman would make no contribution to employee safety. Specifically,

(a) The amount of a conductor's time now occupied by making reports is so small that he is available to perform other duties at most times;

(b) Due to improvement in roadbed, rails, equipment and communication, the amount of work for brakemen to perform has greatly diminished to the point that the "third" brakeman is simply a passenger on most freight trains, and brakemen do not now have the duty of stopping trains, even in emergency, due to employment of air brake systems which stop trains automatically in emergencies;

(c) Due to equipment improvement, draw heads pull out much less frequently than they did in 1907, and flexible cables are now used in place of chains making it a one-man job to handle a car after this has occurred;

(d) Due to improved equipment the occasions for trains to be stopped between stations are much less frequent than in 1907, and it is now only in very lim-

ited circumstances that safety and company rules require flagmen both forward and rear of the train. In any event, a flagman forward of the train is required to be there only briefly, and he can then return to assist with any work to be done, and neither safety nor company rules require the fireman to remain in the engine under these circumstances since he no longer has any duties related to firing or attending to the boiler;

(e) Trains are still frequently stopped at, or switched across, public crossings, and in those instances were posting a signalman is required by considerations of public safety this can be readily accomplished without a crew of six men as required by the Act;

(f) In switching, the much improved couplers and air hoses now in use require only that the brakeman lift a handle causing the cars to uncouple, or to engage the air hoses when cars are being coupled, either operation requiring only 2 or 3 seconds to accomplish and is a one-man job; and

(g) Switching and other train movements utilizing the present equipment can be done most safely by the exposure of the minimum number of employees to the hazards of the employment that are required to perform the work.

Under prevailing circumstances, a crew of four or less would achieve the maximum level of public and employee safety in the operation of a freight train, and the mandatory inclusion of two or more unneeded employees on freight trains unnecessarily exposes them to the hazards of the employment and tends to mitigate against safety in the operation for this reason and also by providing occasion for division and diversion of responsibilities and duties of crewmen and distraction of attention of other crewmen necessary to the operations.

11.

In 1914 the Supreme Court of Arkansas held in *St. Louis, I. M. & S. Ry. Co. v. State*, 114 Ark. 486, 170 S.W. 580, that the evidence was sufficient on the question of whether Act 67 of 1913 promoted public and employee safety that it could not say "that the Legislature had no grounds for adopting this requirement" of a six-man switch crew. The Supreme Court of the United States affirmed. *St. Louis, Iron Mountain & Southern Railway Co. v. State of Arkansas*, 240 U. S. 518. Both courts regarded their prior decisions in the freight crew case to be governing, there being no showing of substantial change in circumstances. Due to improved equipment, switching operations now can be safely performed with a crew of less than six, and in almost every instance can be safely performed with a crew of not more than four. There has also been a material change in the burden of complying with this Act in that the cost of compliance for the year 1914 for St. Louis, I. M. & S. Ry. Co. (predecessor of Missouri Pacific Railroad Company) was $54,800 and this cost has increased to the extent that the cost to Missouri Pacific Railroad Company for the year 1962 was approximately $1,022,000. Similar increases in cost of compliance have been experienced by the other plaintiffs. Under prevailing circumstances, a crew of four or less would achieve the maximum level of public and employee safety in the operations conducted by a switch crew, and the mandatory inclusion of two or more unneeded employees on switch crews unnecessarily exposes them to the hazards of the employment and tends to mitigate against safety in the operation for this reason and also by providing occasion for division and diversion of responsibilities and duties of crewmen and distraction of attention of other crewmen necessary to the operations.

12.

In a suit culminating in *Missouri Pac. R. Co. v. Norwood,* 13 F.S. 24 (1933) it was asserted that the 1907 and 1913 Acts had become repugnant to the United States Constitution due to the changed circumstances upon which they operated since the prior opinions of the United States Supreme Court. That Court defined the constitutional issues presented (283 U.S. 249) and then amended its mandate to permit trial on those issues (283 U.S. 809). The three-judge District Court referred the case to a master with directions to receive evidence on two questions: (1) whether there were changed conditions tending to show that dangers to employees or public, against which the Acts were intended to guard, no longer existed or were so materially lessened as to render the Acts unnecessary and arbitrary, and (2) whether the expense of complying with the Acts had become relatively so much more burdensome as to render compliance therewith unreasonable. Based on the evidence so taken, the Court found that there was insufficient change in those conditions to demonstrate that the Acts had become unconstitutional in their operation, and the decision was affirmed in a per curiam order (290 U.S. 600). The record in that case consisted largely of the methods and circumstances of operation of Missouri Pacific Railroad Company subsequent to the passage of the Acts up to 1931. Subsequent to the period so examined by the court, improvements and advancements in equipment and methods of operation by the railroad industry in general, by plaintiffs, and by Missouri Pacific Railroad Company in particular, have either eliminated or materially reduced the hazards to employees and the public existing when the Acts were passed and during the period reviewed in the *Norwood* decision, and the cost of compliance with these Acts has materially increased as to these plaintiffs. This reduction of hazards has been brought about by the expenditure of vast sums by plaintiffs for

improvement of rail, roadbed, ties, locomotives, freight cars, communication equipment, traffic control equipment and safety devices. As a result thereof, these relevant changes have occurred:

(a) *Locomotives.* In 1931 Missouri Pacific Railroad Company had 824 freight locomotives and 217 switch engines, all powered by steam, and 410 of the freight locomotives had been in service since prior to 1908. At the end of 1962, this Company had 139 freight locomotives, 113 switch engines, and 415 multiple purpose locomotives available for either freight or switching service, and each of these locomotives employed diesel-electric power. The last steam powered locomotive was retired several years ago, and this complete conversion to diesel-electric motive power substantially reduces hazards and discomfort to crew members, and eliminates the duties previously performed by the fireman. During the year ending June 30, 1931, 16 persons were killed and 259 injured due to failures in steam locomotives on all Class I railroads in the United States, and during the 10-year period ending June 30, 1931, six persons were killed and 179 persons injured from this cause on the Missouri Pacific Railroad alone. Locomotive improvements contributing to the safety of employees have been such that in 1961 no person was killed or injured due to failures in steam locomotives on any Class I railroad in the United States and only seven persons received injuries due to defects in diesel or other locomotives.

(b) *Freight cars, couplers, brakes, trackage and roadbed.* Improvements made since the *Norwood* decision have included strengthening rolling stock, complete elimination of arch bars and wooden underframes on cars, adoption of journal lubricator packs, strengthening couplers and journals, employment of roller bearings, installation of heavier rail, elimination of untreated ties, increased side clearances in yards, lengthened and new sidings, installation of auto-

matic block signal and centralized traffic control, installation of radio equipment for communication between cabooses, engines and base stations, adoption of more effective braking systems, employment of mechanized laying of rail and tamping of ballast, chemical control of vegetation on right-of-way, substitution of electric lights and lanterns in lieu of oil lights, installation of hot box detectors, installation of grade separations and automatic signal devices at grade crossings, all of which have greatly reduced the hazards encountered by employees in freight and yard service. In the years 1924 through 1928, inclusive, Missouri Pacific Railroad Company transported an aggregate of 1,090,448,051 car miles in Arkansas during the course of which there were 727 road trainmen in freight service injured, and 603 yardmen injured. Due to the reduction of the hazards of the employment, during the years 1958 through 1962, inclusive, only 85 road trainmen in freight service and 92 yardmen were injured in Arkansas, during which period this Company transported 1,338,459,454 car miles in the State.

(c) *Operating methods and duties of trainmen.* Duties of trainmen have been greatly diminished by elimination of water stops that were necessary for steam locomotives, by closing stations at which stops previously were made, and by virtually complete elimination of handling of less than carload freight by road crews. At, and prior to, the time of the *Norwood* decision much of a freight crew's time was required to load and unload l.c.l. merchandise carried in freight cars, and handling and delivery of this freight is now done by other employees using trucks. Trainmen are no longer required to ride in the middle of trains, nor on the tops of trains, and rules of Missouri Pacific Railroad Company prohibit riding on the top of a moving car. Improved equipment heretofore referred to has greatly reduced "emergency" situations on the road requiring the performance of any work by train crews, and improved

communication and mobile repair equipment has shifted the principal burden of that work from train crews to maintenance employees who are called to correct derailments and other malfunctions. The conductor no longer is required to spend more than a few minutes on record keeping functions on a run, and the fireman no longer has any duties with regard to firing the locomotive or tending to the boiler. The diminution of hazards incident to Missouri Pacific Railroad Company's operations resulting from the foregoing improvements has been sufficiently effective that in the years 1958 through 1962 train and yard service accidents in Arkansas produced injuries to all persons at an average rate of only .00045 per 100,000 car miles, and .02534 per 100,000 train miles, as compared to corresponding injury rates for the 1924 through 1928 period considered by the court in the *Norwood* case of .00276 per 100,000 car miles, and .07176 per 100,000 train miles.

(d) *Cost of compliance.* In 1929 (the most recent year for which this evidence was presented in *Norwood*) the total cost of compliance with the two laws in question to Missouri Pacific Railroad Company was $481,866 representing 3.94% of the Company's net income for that year. The cost of compliance for the year 1962 was approximately $2,720,000 representing approximately 25.96% of the Company's net income. This cost has become so much more burdensome, both relatively and absolutely, since *Norwood* as to render compliance therewith unreasonable. The cumulative effect of the changes herein described since the *Norwood* decision and those subsequent to the passage of these Acts and prior to *Norwood*, is that whatever support there may have been for these Acts when adopted, they have now become repugnant to the United States Constitution in their present operation in the particulars set out in Paragraphs 6, 7, 8, and 9.

13.

The improvements heretofore described have been adopted to substantially the same extent with regard to increased safety and diminished workload on switch and freight crews by each of the plaintiffs. This has resulted in a radical reduction in casualties incurred and those hazards that do persist are not lessened or corrected by adding more employees than needed to perform the duties incident to operation of freight and switching activities. The requirement of a six-man freight crew and a six-man switch crew has no logical nor rational relationship to safety of employees or the public, and freight and switch crews can safely carry out their duties with no more than four men. The Acts are therefore unconstitutional as applied to all plaintiffs for the reasons set out in Paragraphs 6, 7, 8, and 9.

14.

Commencing on November 2, 1959, there arose a national labor dispute between most of the nation's railroads, including the plaintiffs, and their operating employees represented by various railroad operating unions. This dispute arose as a result of service of notices upon the unions pursuant to section 6 of the Railway Labor Act (45 U.S.C. §156), by the aforementioned railroads, proposing changes in existing collective bargaining agreements relating to the use, in Arkansas as well as all other states in the continental United States, of firemen, the consist of train crews, and other subjects. On September 7, 1960, the unions served joint notices, pursuant to section 6 of the Railway Labor Act, upon the railroads, relating among other subjects, to the consist of crews in Arkansas and all other states of the continental United States. Since the dispute was national in scope the railroads and the unions were represented by national committees for the necessary bargaining and related handling on the subject of the notices.

15.

On October 17, 1960, the parties to the labor dispute, through their representatives, entered into an agreement for the appointment of a Presidential Railroad Commission to investigate the facts and make recommendations for the fair and proper resolution of the labor dispute arising out of the notices served by both the railroads and the unions. The agreement further provided that the Commission was to report its findings and recommendations to the President of the United States. An executive order establishing the Presidential Railroad Commission was issued on November 1, 1960.

16.

On February 28, 1962, after more than thirteen months of study and deliberation concerning the issues involved in the national labor dispute, the Presidential Railroad Commission issued its report and recommendations which were accepted by the railroads but rejected by the unions. This report found firemen unnecessary on freight trains and the recommendations provided for the elimination of firemen in freight service and for procedures where the number of brakemen could be reduced. In conferences following issuance of the report of the Commission, the railroads sought to negotiate changes in work rules within the framework of the recommendations of the Commission, but the unions refused to consider any settlement of the national labor dispute on the basis of those recommendations.

17.

On May 21, 1962, the unions sent a letter to the National Mediation Board requesting mediation of the national labor dispute pursuant to section 5 of the Railway Labor Act (45 U.S.C. §155). During the pendency of the mediation, the railroads were prohibited from putting into

effect their proposed changes in existing collective bargaining agreements by the provisions of section 6 of the Railway Labor Act (45 U.S.C. §156).

18.

On June 26, 1962, the National Mediation Board, pursuant to section 5, First, of the Railway Labor Act (45 U.S.C. §5, First) proffered arbitration of the national labor dispute under sections 7 and 8 of that Act. The railroads agreed to arbitration, but the unions rejected the proffer, whereupon the National Mediation Board, on July 16, 1962, terminated its services. Under the provisions of section 5, First, of the Railway Labor Act, the railroads were prohibited for thirty days from putting into effect their proposed changes in existing collective bargaining agreements.

19.

On July 17, 1962, the railroads served on the unions a Promulgation of Revisions in Work Rules of operating employees to become effective August 16, 1962. Thereupon, on July 26, 1962, the unions filed suit in the District Court for the Northern District of Illinois, Eastern Division (*Brotherhood of Locomotive Engineers et al. v. Baltimore & Ohio R.R. et al.*, No. 62C1451) to enjoin the railroads from putting into effect the Promulgation of July 17, 1962. On August 8, 1962, following the filing by the railroads of an amended Promulgation of Revisions in Work Rules of operating employees, the District Court issued an order denying the unions' motion for injunction and dismissing their complaint. However, on August 10, 1962, the court entered an order enjoining the railroads from putting into effect the Promulgation pending appeal. This injunction, pending appeal, remained in effect until March 4, 1963, when it was dissolved following the decision of the United

States Supreme Court affirming the decisions of the United States District Court and Court of Appeals (372 U. S. 284).

20.

To avert a threatened strike, the President, by Executive Order dated April 3, 1963, created an Emergency Board pursuant to section 10 of the Railway Labor Act (45 U.S.C. §160) to investigate the national labor dispute. On May 13, 1963, the Emergency Board submitted its report and recommendations which were accepted by the railroads but rejected by the unions as a basis for settling the national labor dispute. From the date of creation of the Emergency Board and for 30 days following the issuance of its report, the railroads were prohibited by section 10 of the Railway Labor Act (45 U.S.C. §160) from putting into effect their proposed changes in existing collective bargaining agreements.

21.

On June 15, 1963, at the request of the President of the United States, the railroads agreed to extend the 30-day status quo period until July 10, 1963. On July 9, 1963, no agreement having been reached, the President proposed that the parties agree to submit all issues in dispute to Supreme Court Justice Arthur J. Goldberg for final settlement. The railroads agreed to the proposal, but the unions rejected the President's request. On July 10, 1963, shortly before the railroads' Promulgation of Revisions in Work Rules was to take effect, the railroads, at the request of the President of the United States, again agreed to maintain the status quo until July 29, 1963. Thereafter, in a Message to Congress, delivered on July 22, 1963, the President recommended legislation designed to provide procedures for settling the national labor dispute.

22.

Following further unsuccessful efforts by the Secretary of Labor to settle the national labor dispute by negotiation and agreement, Congress adopted a Joint Resolution, approved by the President on August 28, 1963 (Public Law 88-108), to provide for the settlement of the national labor dispute. Acting in conformity with section 1 of Public Law 88-108, the railroads, on August 28, 1963, again rescinded their Promulgation of Revisions in Work Rules, which was to have taken effect on August 29, 1963.

23.

Pursuant to Public Law 88-108, an Arbitration Board was formed and first met on September 11, 1963. The Arbitration Board had the duty, pursuant to section 3 of Public Law 88-108, to make a binding award on the disputes raised by the notices of 1959 and 1960 concerning the use of firemen and the consist of road and yard crews. In making its award the Board was directed by said Public Law to give due consideration to adequate and safe transportation service to the public and further, to consider the interests of the railroads and employees affected. Public hearings were held by the Arbitration Board in Washington, D. C., on twenty-nine days between September 24 and November 2, 1963, at which witnesses were heard, exhibits introduced and arguments made.

24.

On November 26, 1963, the Arbitration Board issued its Award and Opinion. On the firemen issue, the Board found that firemen "* * * are not so essential for the safe and efficient operation of road freight and yard diesels that there should continue to be either a national rule or local rules requiring their assignment on all such diesels."

On the consist of train crews, or brakemen issue, the Board found that the proper number of brakemen necessary to be used on trains should be established by negotiation and binding arbitration between individual railroads, including the plaintiffs, and their employees, and the Award provided a binding procedure for the determination of these issues.

25.

The provisions of the Award are binding on all parties, including the plaintiffs, and call for the elimination of firemen, with certain restrictions, contrary to the provisions of Exhibits "A" and "B", and permit the reduction of brakemen and flagmen, with certain limitations below the number required by Exhibits "A" and "B". The arbitration Award was the product of the federal mandate set forth in Public Law 88-108, and it was imposed upon the plaintiffs and their employees to settle a labor dispute which threatened the nation with an emergency. The Award has the sanction and effect of federal law and it is inconsistent with and contrary to the provisions of Exhibits "A" and "B".

26.

As a result of the binding Award, made pursuant to Public Law 88-108, and enacted under the authority of Article I, Section 8, Clause 3 of the United States Constitution, the federal government has entered the field pertaining to regulation of manning of trains and locomotives and, by reason of the commerce clause and supremacy clause of the United States Constitution, has pre-empted the State of Arkansas' power and authority to enforce state legislation inconsistent with, and contrary to, that Award.

27.

The enforcement of Exhibits "A" and "B" will frustrate, hinder and prevent the execution and operation in

Arkansas of Public Law 88-108, and the Award made pursuant thereto, and would further frustrate and prevent the nationally uniform operation of federal legislation intended by the Congress to provide a uniform solution to a national problem.

28.

Plaintiffs have no adequate remedy at law, and unless this Court enters a Judgment declaring these Acts of Arkansas void and invalid and restrains and enjoins the defendants, as hereinafter prayed, plaintiffs will either be compelled to bear the heavy burden and cost of complying with these unconstitutional laws, as hereinbefore alleged, or will be exposed to prosecution for violations of said laws. The maximum penalty for violation of Act 116 of 1907 is $500, each freight train run with a lesser crew than prescribed in the Act to constitute a separate offense. In 1962 Missouri Pacific Railroad Company alone ran 17,657 through freight trains in Arkansas, and therefore its maximum aggregate exposure to the penalties of this Act is approximately $8,828,500 per year for through freight trains alone, and the other plaintiffs also run thousands of freight trains each year in Arkansas and are therefore subject to the same heavy penalties. The minimum penalty for violation of Act 67 of 1913 is $50, each crew operated with less men than prescribed by the Act constituting a separate offense, and there being no maximum limitation on the penalty that can be imposed for each offense. The plaintiffs employ many switch crews in Arkansas each year, and therefore violation of this unconstitutional Act would expose plaintiffs to penalties without limitation to the extent of confiscation of their entire properties. Plaintiffs have suffered irreparable injury, and will continue to suffer irreparable injury so long as they are required to comply with these unconstitutional Acts, for none of which can they be compensated by money damages.

Wherefore, plaintiffs pray the Court: (a) That it notify the Chief Judge of the United States Court of Appeals for the Eighth Circuit of the filing of this Complaint, so that a three-judge court can be convened pursuant to Title 28, United States Code, Sections 2281-2284, inclusive; (b) That the Court advance this action on the docket and order a speedy hearing thereof; (c) That the Court adjudge and declare Act 116 of the Acts of Arkansas of 1907 and Act 67 of the Acts of Arkansas of 1913, and each of them, to be null and void, unconstitutional and of no force and effect; (d) That the Court enter permanent injunctions restraining the defendants, all persons acting under their direction, and all persons acting in concert with them, from enforcing or attempting to enforce Act 116 of the Acts of Arkansas of 1907 and Act 67 of the Acts of Arkansas of 1913, or from advising, instituting, prosecuting or aiding in any action, suit or proceeding of any kind or character to recover from or impose upon or enforce against plaintiffs, their officers, agents or employees, or any of them, any penalty or damage for failure or refusal to obey, observe or comply with the provisions of said Acts, or either of them, or from interfering with or attempting to interfere with or from advising, instituting, prosecuting or aiding in any action, suit or proceeding to interfere with, restrain or prevent plaintiffs, their officers, agents or employees, or any of them, from operating trains, engines, and employing switch crews within the State of Arkansas without complying with the said Acts; (e) That the Court grant such other or different relief as to the Court may seem just and proper.

Clyde W. Fiddes, Roy P. Cosper, 1517 West Front Street, Tyler, Texas;

Barrett, Wheatley, Smith & Deacon, Citizens Bank Building, Jonesboro, Arkansas;

Attorneys for St. Louis Southwestern Railway Company.

Ernest D. Grinnell, 906 Olive Street, St. Louis, Missouri 63101;

Warner, Warner, Ragon & Smith, 214 North 6th Street, Fort Smith, Arkansas;

Attorneys for St. Louis San Francisco Railway Co.

Martin L. Cassell, E. D. Curlee, 139 West Van Buren Street, Chicago, Illinois 60605;

Wright, Lindsey, Jennings, Lester & Shults, Tower Building, Little Rock, Arkansas;

Attorneys for Chicago, Rock Island and Pacific Railroad Company.

William E. Davis, 114 West 11th Street, Kansas City, Missouri 64105;

Hardin, Barton & Hardin, Merchants National Bank Building, Fort Smith, Arkansas;

Attorneys for The Kansas City Southern Railway Co.

Mark M. Hennelly, R. W. Yost, 210 North 13th Street, St. Louis 3, Missouri;

William J. Smith, Herschel H. Friday, Robert V. Light, 1100 Boyle Building, Little Rock, Arkansas;

Attorneys for The Texas and Pacific Railway Company and Missouri Pacific Railroad Company, by Robert V. Light, 1100 Boyle Building, Little Rock, Arkansas.

Exhibit "A" to Complaint.

No. 116 OF THE ACTS OF ARKANSAS OF 1907.

Section 1. No railroad company or officer of court owning or operating any line or lines of railroad in this State, and engaged in the transportation of freight over its line or lines shall equip any of its said freight trains with a crew consisting of less than an engineer, a fireman, a conductor

and three (3) brakemen, regardless of any modern equipment of automatic couplers and air brakes, except as hereinafter provided.

Section 2. This Act shall not apply to any railroad company or officer of court whose line or lines are less than fifty (50) miles in length, nor to any railroad in this State, regardless of the length of the said lines, where said freight train so operated shall consist of less than twenty-five (25) cars, it being the purpose of this Act to require all railroads in this State whose line or lines are over fifty (50) miles in length engaged in hauling a freight train consisting of twenty-five (25) cars or more, to equip the same with a crew consisting of not less than an engineer, fireman, a conductor and three (3) brakemen, but nothing in this Act shall be construed so as to prevent any railroad company or officer of court from adding to or increasing its crew beyond the number set out in this Act.

Section 3. Any railroad company or officer of court violating any of the provisions of this Act shall be fined for each offense not less than one hundred dollars ($100.00) nor more than five hundred dollars ($500.00), and each freight train so illegally run shall constitute a separate offense. Provided, the penalties of this Act shall not apply during strikes of men in train service of lines involved.

Section 4. All laws and parts of laws in conflict herewith are repealed and this Act shall take effect and be in force thirty days after its passage.

Exhibit "B" to Complaint.

No. 67 OF THE ACTS OF ARKANSAS OF 1913.

Section 1. That no railroad company or corporation owning or operating any yards or terminals in the cities within this State, where switching, pushing or transferring

of cars are made across public crossings within the city limits of the cities shall operate their switch crew or crews with less than one engineer, a fireman, a foreman and three helpers.

Section 2. It being the purpose of this Act to require all railroad companies or corporations who operate any yards or terminals within this State who do switching, pushing or transferring of cars across public crossings within the city limits of the cities to operate said switch crew or crews with not less than one engineer, a fireman, a foreman and three helpers, but nothing in this Act shall be so construed as to prevent any railroad company or corporation from adding to or increasing their switch crew or crews beyond the number set out in this Act.

Section 3. The provisions of this Act shall only apply to cities of the first and second class and shall not apply to railroad companies or corporations operating railroads less than one hundred miles in length.

Section 4. Any railroad company or corporation violating the provisions of this Act shall be fined for each separate offense not less than fifty dollars and each crew so illegally operated shall constitute a separate offense.

Section 5. This Act shall take effect and be in force after May 1, 1913.

MOTION OF THE BROTHERHOOD OF LOCOMOTIVE ENGINEERS, ET AL. FOR LEAVE TO INTERVENE.

(Filed April 29, 1964.)

(Formal parts omitted.)

The Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen, the Brother-

hood of Railroad Trainmen, the Order of Railway Conductors and Brakemen, and the Switchmen's Union of North America move for leave to intervene as parties defendant in the above-captioned matter for the following reasons:

1.

Pursuant to legal authorization, the five organizations seeking intervention (hereinafter called Unions) represent, for purposes of collective bargaining and other mutual aid and protection, substantially all of the employees operating the railroads in Arkansas whose jobs are affected by the existence and validity of Arkansas Acts 116 of 1907 and 67 of 1913.

2.

The relief sought by the complaint would have a substantial and permanent damaging effect on the Unions in their capacity as agents and spokesmen for their members in that it would result in the loss of employment of large numbers of such members whose jobs are protected by the statutes being challenged.

3.

The relief sought by the complaint would have a substantial and permanent damaging effect on the Unions in that it would result in a large loss of organizational membership and income because of the loss of employment of large numbers of their members whose jobs are protected by the statutes being challenged.

4.

The relief sought by the complaint would have a substantial and permanent damaging effect on the Unions in that it would result in conditions on the railroads in Ar-

kansas which would endanger their members and the general public in a manner which the Unions are peculiarly qualified to assert and describe to the court.

5.

The Unions and their members are the real parties in interest to this action, the named defendants having been served purely because of their technical standing in an action affecting criminal statutes.

For the above reasons, among others, it is respectfully urged that the court grant the Unions leave to intervene as parties defendant in this action.

Respectfully submitted,

McMath, Leatherman, Woods & Youngdahl, Attorneys for the Unions, 1330 Tower Building, Little Rock, Arkansas 72201, by James E. Youngdahl.

* * * *

ORDER GRANTING INTERVENORS LEAVE TO INTERVENE.

(Filed May 7, 1964.)

On this May 7th, 1964, having considered motion for leave to intervene as parties defendant, heretofore filed by The Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen, the Brotherhood of Railroad Trainmen, the Order of Railway Conductors and Brakemen, and the Switchmen's Union of North America, in the above entitled cause, and for good cause shown,

It Is Ordered and Adjudged that the said Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen, the Brotherhood of Railroad Trainmen, the Order of Railway Conductors and Brakemen, and the Switchmen's Union of North America, be

and hereby are granted leave to intervene as parties defendant herein.

Martin D. Van Oosterhout, United States Circuit Judge, Jno. E. Miller, United States District Judge, J. Smith Henley, United States District Judge.

DEFENDANTS' ANSWER TO COMPLAINT.

(Filed July 10, 1964.)

(Formal Parts Omitted.)

Come the defendants, Lawson E. Glover and John W. Goodson, in their official capacities as Prosecuting Attorneys, by Bruce Bennett, Attorney General and Jack L. Lessenberry, Chief Assistant Attorney General for the State of Arkansas, and state:

1. The defendants admit this court has jurisdiction of this matter, but deny that it has jurisdiction for all of the reasons set forth in Paragraph 1. of the complaint.

2. Defendants admit the allegations contained in Paragraphs 2. and 3. of the complaint.

3. Defendants specifically admit and affirmatively allege that plaintiffs are subject to the provisions of Act 116, Acts of Arkansas of 1907 and Act 67, Acts of Arkansas of 1913.

4. That defendants, Lawson E. Glover and John W. Goodson, are the duly elected, qualified, and acting Prosecuting Attorneys for the Seventh and Eighth Judicial Districts of Arkansas, respectively, and admit the allegations contained in Paragraph 5. of plaintiff's complaint except the allegation that Act 116, Acts of Arkansas of 1907, and Act 67, Acts of Arkansas of 1913, are void and unconstitutional.

5. Defendants deny all of the allegations contained in Paragraphs 6, 7, 8, and 9 of plaintiff's complaint, and state affirmatively that Act 116, Acts of Arkansas of 1907, and Act 67, Acts of Arkansas of 1913, are constitutional and valid in every respect and operate within an area of the police power of the State of Arkansas. That none of the provisions of said acts are arbitrary, capricious, discriminatory or unreasonable. That the State of Arkansas has a responsibility and obligation of requiring the safe operation of railroads in the State of Arkansas. Defendants affirmatively assert that the Acts in question do not violate the due process clause or equal protection clause of the Fourteenth Amendment to the Constitution of the United States. Defendants affirmatively assert that the Acts in question do not violate Article 1, Section 8, Clause 3 of the Constitution of the United States and that the Acts are not contradictory to the National Transportation Policy in the Interstate Commerce Act as amended.

6. That defendants admit that previous litigation which concerned the constitutionality of the Acts in question were decided adversely to plaintiffs, as stated in Paragraphs 10, 11, and 12 of plaintiff's complaint, but deny that the decisions were rendered, or were conditioned, in the way and manner as alleged by plaintiffs.

7. That undoubtedly, plaintiffs have, in the past years, made some improvement in the mechanical operation of their trains, but defendants deny the allegations contained in Paragraph 13 of plaintiff's complaint for lack of technical information and knowledge on which to form a belief. That notwithstanding some improvements have been made by plaintiffs, the defendants affirmatively assert that Act 116 of 1907 and Act 67 of 1913 are constitutional.

8. That defendants admit that there was a national labor dispute involving national railroads and the railroad operating unions as alleged in Paragraph 14 of the complaint, and that negotiations were undertaken by the

railroads and the unions as alleged in Paragraphs 15, 16, 17 and 18 of the complaint. The defendants further admit that litigation resulted as set out in Paragraph 19. of the complaint. However, defendants deny that the negotiations and the litigation had any effect whatsoever concerning the criminal statutes of the State of Arkansas and the constitutionality of the Acts in controversy.

9. That defendants deny the allegations contained in Paragraphs 20, 21, 22, 23, and 24 of the complaint for lack of sufficient information and knowledge on which to form a belief and while admitting that certain acts of the President of the United States, in issuing executing order, the dates, the reference to legislation and other matters which are of national record, the defendants deny the conclusions set forth in the complaint.

10. Defendants specifically deny the allegations contained in Paragraph 25 of the complaint and deny that any award of the Arbitration Board on November 26, 1963, requires plaintiffs to eliminate the employment of firemen or that the Award is contrary to the provisions of the Arkansas Statutes in controversy.

11. That defendants specifically deny the allegations contained in Paragraph 26 of the complaint.

12. Defendants specifically deny the allegations contained in Paragraph 27 of the complaint and deny that the enforcement of the Acts in controversy would hinder or prevent the application of Public Law 88-108 and the Award. Moreover, defendants assert that Public Law 88-108 and the Award do not require a "nationally uniform operation," but that the several states were, and have been, left with full authority to exercise judgment and control over such matters as reasonably within the sphere of the police power of the states.

13. That defendants admit the existence and penalties of Act 116 of 1907 and Act 67 of 1933, and that plaintiffs should comply with the Acts or be exposed to prosecution

for violation. Defendants deny all other allegations set forth in Paragraph 28 of the complaint.

14. That defendants deny each and every material allegation contained in the plaintiffs' complaint not specifically admitted herein.

Wherefore, defendants pray that the complaint of the plaintiffs be dismissed; and all other relief.

Bruce Bennett, Attorney General; Jack L. Lessenberry, Chief Assistant Attorney General; John P. Gill, Assistant Attorney General, Attorneys for Defendants.

INTERVENORS' ANSWER.

(Filed September 4, 1964.)

(Formal parts omitted.)

The Intervenors answer the Complaint as follows:

1.

Intervenors are all unincorporated railway labor associations consisting of a Grand Lodge and subordinate lodges and representing a total of approximately 400,000 members nationally and several thousand in the State of Arkansas. Intervenors' members in Arkansas are members of the general public and are employed on Plaintiffs' lines inside the State under and in accordance with the Arkansas Full Train Crew and Arkansas Full Switch Crew statutes, agreements between the various Intervenors and the Plaintiffs, and various rules. Granting of the relief prayed in the complaint will injuriously affect said members and deprive great numbers of them of their employment and trade, subject them to more hazardous conditions of employment and subject the general public to more dangerous railroad operations, and will hinder the Intervenors from carrying out their lawful objectives.

2.

Intervenors specifically deny the jurisdiction allegations of paragraph 2 of the Complaint, and admit the jurisdiction allegations of paragraphs 1 and 3.

3.

Intervenors admit the allegations of paragraphs 4 and 5 of the Complaint except the assertion in the final sentence of paragraph 5 that the Arkansas statutes in controversy are void and unconstitutional which Intervenors specifically deny.

4.

Intervenors specifically deny each and every allegation of paragraphs 6, 7, 8, 9 and 13, together with all assertions of law and implications of fact therein, except that Intervenors admit the allegation in paragraph 7 that plaintiffs each operate railroads of more than 100 miles and there are other railroad companies in Arkansas with less than 100 and less than 50 miles of line and that Act 116 of 1907 applies to 12 railroads operating in Arkansas and Act 67 of 1913 applies to 8 railroads operating in Arkansas.

5.

Intervenors admit that the three lawsuits noted in paragraphs 10, 11, and 12 were tried and decided adversely to plaintiffs' assertions of law herein, but specifically deny that any relevant technological changes in railroad operations or equipment in Arkansas nor any changed circumstances have rendered ineffective or inapplicable the decision in *Chicago, Rock Island and Pacific Railroad Co. v. State of Arkansas,* 219 U. S. 453 (1911), concerning the necessity for a six-man train crew in the interest of employee and public safety, nor that any relevant technological changes in railroad operations or equipment in Arkansas have reduced the necessity for a six-man switch crew in order to promote public and employee safety as

found in *St. Louis, Iron Mountain & Southern Railway Co. v. State*, 240 U. S. 518 (1916). Intervenors specifically deny that any altered circumstances have occurred or technological changes in railroad operations or equipment have been implemented by these plaintiffs in Arkansas since the decision in *Missouri Pacific Railway Co. v. Norwood*, 283 U. S. 249 (1931) and *Missouri Pacific Railway Co. v. Norwood*, 42 F. 2d 765 (1930) aff'd. 290 U. S. 600 (1933) which has significantly reduced or eliminated the necessity for six-man train and switch crews on Missouri Pacific or the other plaintiffs' trains operating in Arkansas required by law for the safety of the public and railroad employees; and, specifically, Intervenors deny that the duties of firemen have been eliminated as alleged in paragraph 12(a), that there have been any such changes in railroad equipment as alleged in paragraph 12(b) which have eliminated or significantly reduced the hazards to freight and yard employees, nor that any significant changes in operating procedures have occurred since 1931 nor have any minor changes significantly diminished the hazards of duties of railroad employees as alleged in paragraph 12(c).

Moreover, the following technical changes in railroad equipment and operations described in paragraphs 10 and 12 of the complaint had already occurred and their safety effect was weighed, evaluated and found wanting by the Court in *Missouri Pacific Railway Co. v. Norwood*, 42 F. 2d 675 (1930) aff'd. 290 U. S. 600 (1933), specifically:

1. There have been no significant changes in crew duties material to public and employee safety considerations since 1931. The Missouri Pacific Railroad Co. and these other plaintiffs had lost most of their less-than-carload business by the time of the *Norwood* case and thus railroad operating employees had very little loading and unloading duties, the conductor's duties were set and have remained substantially unchanged since then, and today's flagging and switching duty patterns were already set into their present

mold. This feature has not changed significantly since 1931.

2. Larger and more powerful locomotives than were in existence in 1907 and 1914 were in use in 1931, and rolling stock was considerably larger and heavier. Since 1931 engines and rolling stock have grown even more powerful, larger and heavier. Larger, heavier trains travel faster, further and with more dangerous cargo today.

3. Modern air brakes, couplers, switches and signals were being used in 1931 and any technical changes in those devices since then have minimally met the increased hazards produced by the bigger, heavier and faster trains made possible by the diesel locomotive.

4. No significant technical changes in public crossing protection devices have occurred since 1931 in Arkansas and the number of public crossings maintained by these plaintiffs has not diminished since 1931 but instead has grown in excess of several thousands in Arkansas today, yet the volume of motor vehicle traffic using these crossings in Arkansas has grown enormously multiplying the public crossing hazards found critical over 30 years ago in the *Norwood* case.

6.

Intervenors further specifically deny the allegations of paragraphs 10 and 11 that a crew of four or less can operate a freight train or conduct switching operations with substantial safety to the public and the railroad employees as well as can a crew of six, nor that presence of certain crew members as required by law contributes to the dangers and hazards of railroad operations conducted by these plaintiffs.

a) The sole truly significant technological change in Arkansas railroading bearing on public and employee safety which has occurred since the introduction of couplers and air brakes has been the widespread adoption of the diesel

locomotive by plaintiffs during 1954-1958. As a result trains continue to grow even longer and heavier, and also as a result the total property damage from railroad accidents has grown in magnitude and severity. This feature, plus the decline in passenger traffic and the increase in motor vehicle passenger travel has caused significant changes in the nature of the hazards produced by railroad operation:

1. Coinciding with the introduction of diesel locomotives the dollar amount of property damage arising from railroad accidents has grown drastically;

2. Passenger fatalities and injuries have declined as a result of declining passenger traffic;

3. Employee accident *rates* declined relative to gross operating figures—millions of tons, car miles, or train miles—because those latter figures increased dramatically as a function of increased productivity per railroad employee; and

4. The Interstate Commerce Commission definition of "reportable accident" has recently been changed so as to distort any attempted historical correlation time of accident rates based on differing definitions of accident; the result being that the accident rate set forth in the complaint does not accurately and fully measure either the current injuries or damage caused by plaintiffs' operations, nor does it accurately measure the potential hazard to either the employees or the general public.

b) The safety hazards generated by the nature of modern industrial and transportation conditions warrant continued State regulation of railroad operations by specification of crew consist. Intervenors are informed and believe and therefore allege that the type of lading being carried today by these plaintiffs inside the State of Arkansas is such that potential dangers to employees and the public are now multiplied. Giant quantities of industrial chem-

icals of great volatility and enormous destructiveness are today carried at high speeds through several thousand urbanized areas inside Arkansas across public crossings and through switchyards under such operating conditions that a momentary equipment failure or tiny defect can cause a dangerous industrial transportation incident of immense magnitude, the hazards of which can be avoided or minimized only by adequate numbers of skilled railroad employees on the crews operating these trains. Most of this transportation is now conducted at high speeds and on tighter time schedules by means of longer trains made up of larger and heavier rolling stock and on substantially the same roadbeds and curving tracks of thirty years ago, thereby increasing the hazards to the public and the railroad employees, which hazards are directly and materially affected by the size of the crew charged with the responsibilities and duties of this transportation inside Arkansas.

7.

Intervenors have no information or knowledge sufficient to form a belief concerning the true and accurate, relative or absolute cost of compliance, either to the Missouri Pacific Railroad Company or the other plaintiffs, and therefore specifically deny the allegations on that issue in paragraphs 11 and 12 (d); moreover:

a) In connection therewith, Intervenors are informed and believe and therefore allege that plaintiff railroads are in better financial condition today than at any time in their recent past, and the future appears to hold steadily growing increases in freight revenues and a partial resurgence of passenger travel revenues. Railroad technology promises 100 mph passenger trains, unit cargo freight trains, and fully automated-electronically controlled-computerized yard and switching operations. This past fiscal year was highly profitable for the nation's railroads in general and these plaintiffs shared handsomely in this prosperity. Railroad stocks in general have not declined in market value during

the past two years and have actually increased in market value commensurate with comparable industrials, and these plaintiffs' securities have shared in this aspect of resurging railroad prosperity. Railroad stockholder dividends have either remained steady in size or increased in general. and these plaintiffs' stockholder dividends have paralleled this general trend. The relative costs of compliance with the Arkansas Full Crew Laws have not increased unduly in light of the increased efficiency of these railroads resulting from dramatic improvements in productivity per man.

b) The relative cost of compliance for Missouri Pacific Railroad Co. alone in 1931—in the depths of the Depression and just before that company went into bankruptcy for 20 years—was about 1% of its total revenues, and for the other plaintiffs was doubtless not relatively greater, while in 1962 the Intervenors are informed and believe the relative percentiles were not significantly higher.

8.

Intervenors admit the allegations of paragraphs 15 through 22 except insofar as they inaccurately embody the history of the railroad rules dispute, and only to the extent they may accurately state some aspects of the most recent history of the controversy between these Intervenors and certain railroads concerning railroad work rules in non-full crew law states, but Intervenors specifically deny that the scope of the notices published by these Intervenors on September 7, 1960, in the context of that controversy included crew consist matters in Arkansas nor that any award rendered by the Special Arbitration Board under Public Law 88-108 and within the scope of these notices was applicable expressly or impliedly to crew consist matters in Arkansas concerning plaintiffs and the Arkansas members of these Intervenors as alleged in paragraphs 14, 23 and 24 of the Complaint; moreover, Intervenors specifically deny that they are in any manner personally

estopped or otherwise inhibited by law or contract under the Special Arbitration Award as paragraph 25 of the Complaint covertly alleges.

9.

Intervenors specifically deny the allegations of paragraphs 26 and 27 of the Complaint that the federal government has preempted the field of local railroad operations concerning the consist of crews through Public Law 88-108, the Special Arbitration Award, or executive branch pronouncements or actions so as to prevent the operation of the Arkansas statutes in controversy.

10.

Intervenors have no information or knowledge sufficient to form a belief concerning the monetary extent of plaintiffs possible exposure to criminal liability for violation of the Arkansas statutes in controversy, and hold no opinion or belief concerning the adequacy of plaintiffs' remedy at law, and therefore deny these allegations of paragraph 28 of the Complaint.

For the above reasons, among others, the Complaint should be dismissed.

McMath, Leatherman, Woods & Youngdahl, by Eugene F. Mooney, Eugene F. Mooney and James E. Youngdahl, Attorneys for Intervenors, Suite 1330, Tower Building, Little Rock, Arkansas.

MOTION FOR SUMMARY JUDGMENT.

(Filed October 17, 1964.)

(Formal Parts Omitted.)

Under the provisions of Rule 56, F. R. Civ. P., plaintiffs move for Summary Judgment in their favor on the following grounds:

1.

That Act 116 of the Acts of Arkansas of 1907 and Act 67 of the Acts of Arkansas of 1913 are pre-empted by federal legislation in conflict therewith, to-wit: Public Law 88-108 and the award of Arbitration Board No. 282 pursuant thereto; the Railway Labor Act, Title 45, United States Code, Sections 151 et seq.; and the Interstate Commerce Act, Title 49, United States Code, § 1 et seq., and particularly the preamble thereto (49 U.S.C., preceding § 1).

2.

That Act 116 of the Acts of Arkansas of 1907 and Act 67 of the Acts of Arkansas of 1913 constitute discriminatory legislation against interstate commerce in favor of intrastate commerce in contravention of the Commerce Clause of the Constitution of the United States.

3.

That Act 116 of the Acts of Arkansas of 1907 and Act 67 of the Acts of Arkansas of 1913 constitute a denial of the equal protection of the laws to plaintiffs in contravention of the Equal Protection Clause of the Fourteenth Amendment to the Constitution of the United States.

4.

That there is no genuine issue as to any material fact relating to the foregoing allegations.

Wherefore, plaintiffs move for Summary Judgment granting the relief sought in the prayer of the Complaint filed herein.

On Behalf of All Attorneys Signing the Complaint Herein

Robert V. Light, 1100 Boyle Building, Little Rock, Arkansas, Attorney for Plaintiffs.

On March 8, 1965, judgment of the United States District Court was filed. *Chicago, R.I. & Pac. R.R. v. Hardin*, 239 F.Supp. 1 (W.D.Ark. 1965).

On March 15, 1965, the District Court denied Intervenors' Motion to suspend the injunction pending appeal.

On March 27, 1965, Mr. Justice White granted Intervenors' Motion to stay the injunction pending appeal.

On January 31, 1966, the United States Supreme Court reversed the District Court judgment and remanded the case for trial. *Brotherhood of Locomotive Engineers v. Chicago, R.I. & Pac. R.R.*, 382 U.S. 423 (1966).

TRANSCRIPT OF TRIAL.

[Appearances:

For the Plaintiffs:	Mr. Robert V. Light Little Rock, Arkansas
	Mr. Herschel Friday Little Rock, Arkansas
	Mr. Martin M. Lucente Chicago, Illinois
	Mr. Paul Moody St. Louis, Missouri
	Mr. R. W. Yost St. Louis, Missouri
	Mr. E. D. Curlee Chicago, Illinois
For the Defendants:	Mr. Jack Lessenberry Little Rock, Arkansas
	Mr. Leslie Evitts Little Rock, Arkansas

For the Intervenors: Mr. Robert D. Ross
Little Rock, Arkansas
Mr. James E. Youngdahl
Little Rock, Arkansas
Mr. John P. Sizemore
Little Rock, Arkansas
Mr. Eugene Mooney
Lexington, Kentucky]

March 20, 1967.

[*3] Judge Van Oosterhout: Gentlemen, this is Judge Van Oosterhout. A constituted three-Judge Court consisting of Judge Miller, Judge Henley and myself has been designated to hear and decide this case. We are convened for this purpose.

* * * *

[7] Mr. Light: Mr. Ross and I have agreed, subject to the approval of the Court, to put in the case that we have thus far prepared and filed by my offering individually each exhibit, and many of these exhibits are multiple exhibits in one volume, making a brief statement of what the exhibit is. He will then offer his rebuttal testimony to that exhibit. In most instances, he will have cross examined by deposition the witnesses whose testimony I am presenting on our direct case. We have further agreed that with regard to the some ninety exhibits that I have filed, constituting plaintiff's case in chief, except for the few witnesses that will be presented in the traditional manner, Mr. Ross has agreed that he will not require the presence of any of those [8] witnesses for further cross-examination in court. I have made a similar commitment to him with regard to

* Numbers in brackets indicate original page numbers of stenographic transcript.

the thirty-three witnesses whose testimony he has presented on the intervenors' case in chief.

* * * *

Judge Van Oosterhout: That is true with respect to the exhibits that will be introduced by all of the parties, that it will be considered the testimony of the witnesses as if they had appeared and given the full testimony.

Mr. Light: That is our intent. Mr. Youngdahl will have a stipulation pertaining to rulings on admissibility of evidence presented at the time he makes his statement.

Judge Van Oosterhout: I understand that there may be objection to evidence, and you are not waiving that at this time.

Mr. Light: Yes.

* * * *

[18] Mr. Youngdahl: The parties stipulate that the evidence that each party served on the other parties prior to trial, and the depositions taken prior to trial shall be received into the record without objection at the time it is offered at trial, and each party expressly reserves the right to attack the admissibility of any such evidence on the grounds of immateriality, irrelevancy and/or incompetence in their post trial briefs. Objections to proof not described above shall be made at the time it is offered at the trial. Objections made during the taking of depositions shall be [19] treated as if renewed at trial when the deposition is offered.

* * * *

Judge Van Oosterhout: That stipulation, I take it, has been signed by all parties.

Mr. Youngdahl: Yes, Your Honor.

Judge Van Oosterhout: The plaintiff, defendant and intervenor.

* * * *

[20] Mr. Light: At this time, if it please the Court, I offer in evidence Plaintiffs' Exhibits 1 through 17, [21]

which is this printed volume. It consists of the testimony of fourteen officers of the Missouri Pacific Railroad Company. These men are road foremen of engines, trainmasters or in some instances assistant trainmasters. As this testimony and the testimony that will be hereafter received indicates, these men are charged with the daily duty of supervising the operations of trains on the Missouri Pacific Railroad Company. The gist of their testimony here is that they participated in a survey in the summer of 1966 riding trains over their respective jurisdictions for the express purpose of making observations as to how the members of the crew performed their duties, and what duties they had. The observations made from the notes on these trips have been prepared in chart form in Exhibits 15, 16 and 17, and reflect the vital statistics of each of the many, many railroad runs that these men rode and observed for the purposes of reporting to this Court what the actual activities of these train crews were out on the road. Some of these crews, many of these crews are the six-man Arkansas statutory required crews. Then there are other crews in other states that were observed for the purposes of comparison. During the entire studies no accidents occurred, there were no injuries to employees. I offer Plaintiffs' Exhibits 1 through 17.

* * * *

[22] Mr. Ross: If it please the Court, we have taken the depositions of the fifteen witnesses whose testimony appears as Plaintiffs' Exhibits 1 through 14, and I now offer—I think rather than offer them one at a time, I have three copies each of Exhibits marked IRX-1 through 14, Intervenor's rebuttal exhibits 1 through 14. I offer these fourteen exhibits.

* * * *

Judge Van Oosterhout: It will be assumed that all of the exhibits will be received as offered unless otherwise ruled upon.

Mr. Light: The next four exhibits were submitted as exhibits in support of the motion for summary judgment. [23] They are Plaintiffs' Exhibits 18, Message of the President of the United States to the Congress that preceded the enactment of Public Law 88-108 and the appendixes thereto which will reveal something of the history of the railroad crew consist dispute. Plaintiffs' Exhibit 19, which is the Report of the Presidential Railroad Commission concerning this dispute and its recommendations as to its resolutions. Plaintiffs' Exhibit 20, which is the award of Arbitration Board No. 282, with the opinions of the various members, that is, the compulsory arbitration body that resolved on a national level the issue of whether a fireman contributed significantly enough to the safety of railroad operations to justify a national rule requiring his retention. The decision of the Board was that he did not so contribute, and that the railroads were to be permitted to dispose of firemen on all but ten per cent of the railroad runs in the United States, and also deciding on the train crew requirements as distinguished from the engine crew requirements that varying circumstances of railroad operations over the country made it desirable to remit that issue to the individual railroads for resolution by special boards of adjustment to take into account the varying manning requirements that the particular circumstances and the particular runs required. And Plaintiffs' Exhibit 21 are the Awards of those Special Boards of Adjustment convened on the [24] Missouri Pacific Railroad Company and the Texas and Pacific Railroad Company which permitted these railroads to substantially reduce the number of crew members used on their operations in Arkansas beneath the requirements of the Arkansas statutes. I offer these four exhibits into evidence. Mr. Ross does not have rebuttal exhibits to these.

* * * *

[25] Mr. Light: Your Honor, I now offer Plaintiffs' Exhibit 22, which is the testimony of Mr. John G. German, Chief Mechanical Officer of the Missouri Pacific Railroad Company, who testifies in detail with expertise concerning the changes of motive power on American Railroads and on the plaintiff railroads in Arkansas during the period since Norwood was decided up to date, and also historically traces that development back prior to Norwood to the very beginning of the railroad industry. I also offer Plaintiffs' Exhibit 22 which are exhibits to the testimony of Mr. German.

* * * *

Mr. Light: No, sir, I have stated it backward, Your Honor. 22 is his testimony, and 23 are the exhibits to his testimony.

* * * *

[26] Mr. Ross: Intervenors and defendants have taken the depositions of Mr. J. G. German. These depositions are marked IRX-22. We submit this as our rebuttal.

* * * *

Judge Miller: Mr. Ross, was that deposition taken in form of cross-examination of Mr. German or was it taken as a more direct. I don't think it is material, but I would just like to know how you were proceeding.

Mr. Ross: All of the depositions which I took of Mr. Light's witnesses were taken in the form of cross-examination by me, and either Mr. Lessenberry or Mr. Evitts, with redirect by Mr. Light.

* * * *

[29] Mr. Light: At this time, Your Honor, I offer Plaintiffs' Exhibit 24, which is the testimony of Mr. Raymond R. Rich, who is Master Mechanic for the Chicago, Rock Island and Pacific Railroad Company. Mr. Rich commenced his railroad career in 1922 as a fireman on the hand-fired steam locomotive, and testifies pertaining to

the duties and obligations of a fireman in those days and continuing on up to the present, reflecting the diminution and then complete non-existence of any duties for a fireman to carry out on a diesel locomotive. Mr. Rich also testifies in some detail as an expert on the diesel locomotive and its functioning and its maintenance and what duties and what tasks are necessary to keep it operating over the road safely.

* * * *

Mr. Ross: I offer Intervenors' rebuttal exhibits 24, which is the deposition containing the cross-examination of Mr. Rich by the intervenors and by the State.

* * * *

[30] Mr. Light: I offer Plaintiffs' Exhibit 25, which is the testimony of Mr. W. F. Thompson, Senior Assistant General Manager of the Rock Island Railroad Company. Mr. Thompson testifies relative to the operations of his railroad company operated with and without firemen. He testifies concerning the disposition of the conflicting claims of the parties before the Special Board of Adjustment convened on his railroad pursuant to the Award of Arbitration Board 282, and in general describes the operations of his railroad company in light of the impact of the Arkansas-full-crew laws on those operations.

* * * *

Mr. Ross: I offer Intervenors' Rebuttal Exhibit 25, which contains the cross-examination by the intervenors and the State of Mr. W. F. Thompson.

* * * *

Mr. Light: Plaintiffs' Exhibit 26 is the testimony of Mr. E. C. Meinholtz, the Mechanical Engineer of the Missouri Pacific Railroad Company. It pertains to the evolution, technicological evolution of the railroad rolling stock. This is the freight cars and boxcars. Mr. Meinholtz' testimony is supported by photograph exhibits of the various

types of cars that have been in use over [31] the years, and gist of his testimony is that because of technicological improvement in the railroad's rolling stock the operations of railroads in the United States are much safer from the point of view of the employees and the public, and much less occasions for the railroad employees to be stopped on the road, and much less occasion for them to be called upon to make repairs to rolling stock.

* * * *

Mr. Ross: I offer Intervenors' Rebuttal Exhibit 22, which contains the cross-examination by the intervenors and the State of Mr. Meinholtz.

* * * *

Mr. Ross: 26 is the number. I am sorry.

* * * *

Mr. Light: I offer Plaintiffs' Exhibits 27 and 28, 27 is the testimony of Mr. Charles T. Marak, the Signal Engineer of the Missouri Pacific Railroad Company, tracing the development of railroad signalization through the history of railroading and up to the present. Exhibit 28 is a set of exhibits supporting that testimony.

* * * *

[32] Mr. Ross: I offer Intervenors' Rebuttal Exhibit Number 27, which is the cross-examination by the intervenors and the State of Mr. Marak.

* * * *

Mr. Light: Plaintiffs' Exhibit 29 is the testimony of Mr. B. J. Alford, who is Mr. Marak's counterpart on the St. Louis-Southwestern Railroad Company, which is commonly called the Cotton Belt Railroad, who testifies about the historical development of railroad signaling and the signalization on his railroad.

* * * *

Mr. Ross: I introduce Intervenors' Rebuttal Exhibit 29, which contains the cross-examination by intervenor and the State of Mr. Alford.

* * * *

[33] Mr. Light: Plaintiffs' Exhibit 30 is the testimony of William E. Laird, Engineer of Track, of Missouri Pacific Railroad Company. He testifies in detail concerning the improvement of roadbed and track structures used on railroads in the United States, and particularly on the Missouri Pacific Railroad in the State of Arkansas, and the improvements in those facilities since the trial of the Norwood case.

* * * *

Mr. Ross: I introduce Intervenors' Rebuttal Exhibit 30 which contains the cross-examination of Mr. Laird by the intervenors and the State.

* * * *

[34] Mr. Light: I offer Plaintiffs' Exhibit 31, which is the testimony of Mr. F. R. Malott, now retired as Director of Terminals of the Missouri Pacific Railroad Company. He testifies concerning the operation of terminals and of yards and of switching operations in yards on the Missouri Pacific system, the improvements of those activities in terms of safety to the members of the crew and the public during the past thirty-five years, and with particular detail and emphasis on the development of the electronic classification yard such as the one that Missouri Pacific Railroad Company operates at North Little Rock, and the one that Cotton Belt operates at Pine Bluff. I offer the testimony of Mr. Malott.

* * * *

Mr. Ross: I offer Intervenors' Rebuttal Exhibit Number 31, which contains the cross-examination by the intervenors and the State of Mr. Malott.

* * * *

Mr. Light: I offer Plaintiffs' Exhibits 32 through 45 which is the testimony of road foremen of engines, trainmasters and assistant trainmasters of the St. Louis Southwestern Railway Company concerning a survey conducted on that railroad in the summer of 1966 comparable to the [35] one made on the Missouri Pacific, and upon which a report is made in Plaintiffs' Exhibits 1 through 17.

* * * *

Mr. Ross: I offer Intervenors' Rebuttal Exhibits 32 through 41, which are the cross-examination of Mr. Light's witnesses whose testimony is Plaintiffs' Exhibits 32 through 41. We do not have Intervenors' Rebuttal Exhibit 42. We will skip 42. I also offer Rebuttal Exhibit 43, which is the cross-examination of Mr. C. E. Muller.

* * * *

Mr. Ross: Mr. Morris, whose testimony appeared in Plaintiffs' Exhibit 43 was unavailable for cross-examination by the Intervenors and the State because of illness. Mr. Muller was, I believe, Mr. Morris' superior, and his deposition was taken in lieu of Mr. Morris', and I believe that it is stipulated that the answers given in the deposition by Mr. Muller would be as if Morris himself were testifying.

* * * *

[36] Mr. Light: For the record I would like to correct one oversight on my part. Included among Plaintiffs' Exhibits 32 through 45 are the exhibits constituting the testimony of some witnesses who did not participate in this study that the foremen and trainmasters made on the Cotton Belt Railroad. Exhibit 32 is the testimony of Mr. Lacy, who is Superintendent of the Cotton Belt Railroad Company, pertaining to the impact of the full-crew laws on his railroad in Arkansas. Exhibit 43 as Mr. Ross pointed out is the testimony of Mr. Morris, to which the cross-examination of Mr. Muller is responsive on the subject of the cost of compliance to the Cotton Belt Railroad Com-

pany with the Arkansas crew consist laws, and Exhibits 44 and 45 are exhibits pertaining to that cost.

* * * *

[37] Mr. Light: Plaintiffs' Exhibit 46 is the testimony of Mr. R. J. Blair, Vice President and General Manager of the Kansas City Southern Railway Company, the chief operating official of that company, who began railroad service as a brakeman in 1927, and he testifies pertaining to the impact of the Arkansas full-crew laws on the operation of his railroad.

* * * *

Mr. Ross: I offer Intervenors' Rebuttal Exhibit Number 46, which contains the cross-examination of Mr. [38] Blair by the Intervenors and the State.

* * * *

Mr. Light: I now offer Plaintiffs' Exhibits 47 through 63, 47 through 74, inclusive. 47 through 63 constitutes the testimony of a major operating official of each of the seventeen intrastate railroads that operate in Arkansas, and particularly describe the scope of the operations of their railroads. These railroads, by the way, are ones that are exempted from the Arkansas full-crew laws by virtue of the 100-mile and 50-mile exemptions. They relate to the scope of the operation of their respective railroads, the size crews they use being uninhibited by the State crew consist laws. These exhibits reflect that fifteen of the seventeen railroads operating in this state uninhibited by the laws have crews of less than six men as required [39] by the statute, and that the other two employ six-men crews by reasons unrelated to safety. Exhibit 64 pertains to the only interstate railroad operating in the State of Arkansas with less than 50-miles of lines, and therefore exempt from the law. It employs a four-man crew. 65 and 66 pertain to the only two railroads in Arkansas with between 100 and 50 miles exempt from one statute and sub-

ject to the other. Plaintiffs' Exhibit 67 pertains to some statistical data concerning the railroad operations in Arkansas. Exhibit C to Plaintiffs' Exhibit 67 may be of some help to the Court in following the testimony through the trial of particular railroad operations. This is a current official railroad map of the State of Arkansas, and ready reference can be made to it during testimony concerning any operation pertaining to any railroad in the State is being received. Plaintiffs' Exhibits 68 through 73 pertains to the operation of six industrial railroad facilities in Arkansas, and the size crews employed by the industries which are uninhibited by the full-crew statute. Finally, Exhibits 56 and 74 pertain to the two railroad operations conducted in Arkansas by the United States Government at the Little Rock Air Force Base and the Pine Bluff Arsenal, and those exhibits reflect that those operations are conducted with crews of three men.

• • • •

[40] Mr. Light: I offer Exhibit 76, 75 and 76 which are testimony of Mr. Battaile and Mr. Buckner of the St. Louis-San Francisco Railroad Company, and pertain to their participation in a study on their railroad of the operations of freight and switch crews similar to that already presented on behalf of Missouri-Pacific and the Cotton Belt.

• • • •

Mr. Ross: I offer Intervenors' Rebuttal Exhibits number 75 in response to, as cross-examination of Mr. Battaile, Intervenors' Rebuttal Exhibit number 76 as cross-examination of Mr. Buckner.

• • • •

Mr. Light: I offer Plaintiffs' Exhibit 77, the testimony of Mr. R. W. Troth, now retired, but formerly general superintendent of the communications and signals of the St. Louis-San Francsico Railway Company, with experience in that area from 1919. He testifies pertaining to the

signalization of his railroad, of the American railroads in general, of the historical development in railroad signalization.

* * * *

[41] Mr. Ross: I offer Intervenors' Rebuttal Exhibit number 77, which contains the cross-examination by the Intervenors and the State of Mr. Troth.

* * * *

Mr. Lucente: If the Court please, I offer Plaintiffs' Exhibits 78, 79 and 80. Exhibit 78 is a statement by Mr. James E. Wolfe. Mr. Wolfe is currently chairman of the National Railway Labor Conference. He was chairman of a conference committee on behalf of the Western Railroad during the period of the dispute which went to the Presidential Railroad Commission and to Arbitration Board No. 282. Mr. Wolfe was a carrier member of the Presidential Railroad Commission. He sat as a carrier member of Arbitration Board No. 282, and in his capacity as Chairman of the National Conference he participated in all the subsequent proceedings involving interpretations of the awards of Board 282. Mr. Wolfe was also a member of a panel created by the Award of Arbitration Board No. 282 created for the purpose of surveying the results of operations without firemen. That panel consisted of two carrier members, Mr. Wolfe and Mr. Hallman, and two union representatives, a Mr. Coglin, who was a representative of the Brotherhood [42] of Engineers, and a Mr. Shattuck, representative of the Brotherhood of Firemen and Enginemen. The report of the Joint National Board is introduced by Mr. Wolfe and identified as Plaintiffs' Exhibit 79. The discussion of the study that the members of the Joint National Board made, the conclusions of the panel with respect to safety operations without firemen in the two year period following the effective date of the award. Mr. Wolfe also introduces or has as one of his exhibits, which we have identified as Plaintiffs' Exhibit

number 80. Exhibit number 80 consists of a series of awards of Special Boards of Adjustment, which passed on the question of what size crew should be used in freight and yard service insofar as the train crew component of the employees is concerned, that is, conductors, brakemen and helpers. Mr. Wolfe also summarizes in his statement the results of all of the boards sitting on the railroads throughout the country, and he shows the certain statistical tables attached to Exhibit number 79 the extent to which the awards have authorized reductions in the sizes of crews in freight and yard service and the size of the crew which the awards have authorized the carriers to use in those two classes of service, also in passenger service to some extent. The material I have described, recapitulated, Plaintiffs' Exhibit 78, Mr. Wolfe's statement; Plaintiffs' Exhibit 79, which is a report of the [43] Joint National Board; Plaintiffs' Exhibit 80 which is a collection of representative awards by Special Boards of Adjustment.

• • • •

Mr. Ross: I offer Intervenors' Rebuttal Exhibit 78, which contains the cross-examination by the Intervenors and the State of Mr. Wolfe.

• • • •

Mr. Light: I offer as Plaintiffs' Exhibit 81 the testimony of Mr. A. H. Lott, Assistant Auditor of the St. Louis-San Francisco Railroad Company, who testifies pertaining to the cost of appliance to his railroad company complying with Arkansas crew consist leglisation.

• • • •

Mr. Ross: I offer Intervenors' Rebuttal Exhibit number 81, which is the cross-examination by the State and the Intervenors of Mr. Lott.

• • • •

Mr. Light: I offer Plaintiffs' Exhibit number 82, 83, 84, which are respectively the answers of Missouri Pacific, [44] Cotton Belt, and Frisco Railroad Companies to interrogatories propounded to them by the plaintiffs in this case.

Judge Miller: By the Intervenors.

Mr. Light: Yes, sir. I offer Plaintiffs' Exhibit 85, which is the testimony of Mr. M. L. Hall, Assistant Director of Cost Research for Missouri Pacific, who testifies pertaining to the cost of compliance to the Missouri Pacific Railroad Company of these statutes.

* * * *

Mr. Ross: I offer Intervenors' Rebuttal Exhibit Number 85, which contains the cross-examination of Mr. Hall.

* * * *

[45] Mr. Light: I offer as Plaintiffs' Exhibit number 86 the testimony of Mr. D. E. Farrar, Vice President of Personnel of the Kansas City Southern Railway Company, who testifies concerning the impact of the crew consist statute on his railroad pertaining to the effect of the award of Board 282 on his railroad, and pertaining to the cost of compliance under the Arkansas crew consist statute to his railroad.

* * * *

Mr. Ross: Because of the illness of Mr. Farrar and unavailability for cross-examination, Intervenors and the State agreed to take the deposition of Mr. H. K. Vollrath, who, I believe, was an employee in the same department as Mr. Farrar and cross-examination was on the, was cross-examination concerning the exhibit of Mr. Farrar. I introduce Intervenors' Rebuttal Exhibit number 86.

* * * *

Mr. Light: I offer as Plaintiffs' Exhibit 87 the answer of the Kansas City Southern Railway Company to interrogatories propounded by the Intervenors as Plaintiffs'

[46] Exhibit 88 and the testimony of Joseph Hyzny, who testifies pertaining to the cost of compliance to the Rock Island Railroad Company of the Arkansas statutes.

* * * *

Mr. Ross: I offer Intervenors' Rebuttal Exhibit number 88, which contains the cross-examination by the Intervenors and the State of Mr. Hyzny.

* * * *

Mr. Light: As Plaintiffs' Exhibit 89 I offer the answers of the Rock Island Railroad to the interrogatories propounded by the Intervenors, and finally as Plaintiffs' Exhibit 90 I offer the testimony of Mr. J. K. Beshears, Vice President to Personnel of the St. Louis-San Francisco Railway Company, who testifies pertaining to the impact on his railroad of the Arkansas crew consist legislation.

* * * *

Mr. Ross: I offer Intervenors' Rebuttal Exhibit 90, which contains the cross-examination by the State and the Intervenors of Beshears.

* * * *

[47] Mr. Lessenberry: The Defendants' Exhibit submitted as its proof in this case consist of nine separate affidavits executed by eight witnesses. Defendants' Exhibit 1 is the affidavit of J. R. Henderson, who is the Engineer in charge of Planning and Research of the Arkansas State Highway Department. In that exhibit he compares motor vehicle registrations and motor fuel consumption for certain years. I think he relates to some years in 1930 as opposed to 1965. Defendants' Exhibit 2 is the affidavit of the Secretary of State of Arkansas, in regard to defeat of initiated Act No. 1 which was Repeal of Full Crew which was voted upon in the 1958 general election. Defendants' Exhibit 3 is another [48] affidavit of Kelly Bryant in regard to population in Arkansas in certain periods. Defendants' Exhibit 4 is the affidavit of Frank

W. Cannady, Supervisor of Research and Statistics of the State Department of Education of the State of Arkansas in regard to public schools, enrollment, school consolidation, bussing of school children, and related information. Defendants' Exhibit 5 is the affidavit of Norman F. Williams, who is the State Geologist of the Arkansas Geological Commission regarding the geographic features of the State of Arkansas and certain data regarding mine production by car loads in Arkansas during 1930 and 1960. Defendants' Exhibit Number 6 is the affidavit of Jennie Furr, who is Secretary of the Arkansas Commerce Commission, reporting on certain data which has been extracted from the annual reports of railroad companies operating in Arkansas in regard to the number of highway grade crossings, locomotive miles and freight car miles for certain periods. The concluding three exhibits, Defendants' Exhibits 7, 8 and 9, are made by mayors of cities in Arkansas, Mayor Casey Laman of North Little Rock, Mayor Austin Franks, mayor of Pine Bluff, and Mayor Harold Falls, mayor of Wynne, Arkansas. Those affidavits are similar in nature and is a brief resume of the increase in population of those communities, their size and location in regard to the state, the highway traffic [49] and railroad traffic, industries and matters of this nature. This is all of the testimony of proof offered in behalf of the defendants. I might add that during the presentation of exhibits offered by Mr. Light, particularly Plaintiffs' Exhibits 47 through 74, you might recall this is the seventeen intrastate railroads, the six industrial lines and two Governmental units, and Mr. Ross mentioned that there was no rebuttal in behalf of the Intervenors, and there is none in behalf of the defendants.

* * * *

Mr. Ross: Intervenors have thirty-four exhibits. I will not discuss these exhibits individually, but discuss them

as a group. The exhibits submitted by the Intervenors are statements or testimony of operating people. These are the firemen, the engineers, the conductors, and brakemen who operate the railroads. We have endeavored to obtain statements from operating people of each railroad covering the major portions of those railroads and the operating situations and conditions which these railroads and travel over them present in the State of Arkansas. Exhibits 1 through 6 are operating employees of the Chicago, Rock Island and Pacific Railroad Company. Exhibits 7 through 10 are operating employees of the Kansas City [50] Southern Railway Company. Exhibits 11 through 23 are statements of operating employees of the Missouri Pacific Railroad Company. Exhibits 24 through 27 are statements from operating people, operating employees of the St. Louis-San Francisco Railway Company, Frisco lines. Exhibit 28 which we had originally sent to the Court, a copy to the Court, we will not, we are withdrawing that exhibit. Mr. Mabry was ill and unavailable to appear for cross-examination by the carriers' attorneys, and we are therefore withdrawing number 28. If you have a copy of my schedule of exhibits, which I served, Exhibit 29 refers to the testimony of Bernard Meyers, refers to it as being an employee of the St. Louis-San Francisco Railway Company. This should be St. Louis Southwestern Railway Company. I would like to call the attention of the Court, since we are withdrawing Exhibit 28, which is Mr. Mabry's testimony, Mr. Meyers in Exhibit 29 refers to Mr. Mabry's statement. I would ask the Court to delete that. It is only one sentence at the bottom of page 1 of Mr. Meyers' testimony. I would ask the Court to delete that sentence when considering Mr. Meyers' testimony, Exhibit 29. Exhibits 29 through 35 are statements of operating employees of the St. Louis Southwestern Railway Company. Exhibit 34 is the statement of Mr. Lloyd C. Burrow. We have indicated to the plaintiffs [51] that Mr. Burrow would be a live witness.

We wish to submit Exhibit 34 as Mr. Burrow's statement, and Mr. Burrow will only be called by us in the form of rebuttal to any oral testimony presented by the plaintiffs, and there is a good possibility that we will not call Mr. Burrow as a live witness. But we do submit Exhibit 34 as his statement.

* * * *

Mr. Ross: The exhibits that I am introducing are IX-1 through 35.

Judge Henley: To be distinguished from the earlier IRX exhibits which we have bearing some of the same numbers?

Mr. Ross: That is correct, Your Honor. We have endeavored to eliminate any confusion in our numbering, but it might still be a little complicated. The IRX are Intervenors' rebuttal testimony, and the IX are our [52] testimony in chief.

* * * *

[53] Judge Van Oosterhout: I take it that we are ready to proceed to the oral testimony of this case. You may call your first witness, Mr. Light.

* * * *

[54] **MR. J. G. SHEPPARD,**

being called to the witness stand on behalf of the plaintiffs, after being duly sworn, testifies as follows:

Direct Examination,

By Mr. Light:

* * * *

Q. State your name, please. A. John Glenn Sheppard.

Q. Where do you live, Mr. Sheppard? A. 1809 South Jackson, Little Rock, Arkansas.

Q. What is your occupation? A. I am General Manager of the Southern District, Missouri Pacific Railroad Company.

Q. Of what does the Southern District comprise? A. Operations in the States of Illinois, Missouri, Arkansas, Louisiana, Memphis, Tennessee, Natchez, Mississippi.

Q. Are all of the operations of Missouri Pacific Railroad Company within the State of Arkansas under your jurisdiction? A. No, sir, from Van Buren to the Oklahoma state line is not.

Q. What is that distance? A. That is about six miles.

[55] Q. Is there any other area in Arkansas of the Missouri Pacific operations not under your jurisdiction? A. From Cotter, Arkansas, to the Missouri state line.

Q. What is that distance? A. About fifty-five miles.

Q. The balance of the Missouri Pacific operations in Arkansas are your responsibility? A. Yes, sir.

Q. State what your duties are, Mr. Sheppard, as General Manager. A. Management of the district, which includes the operation and maintenance of the entire district.

Q. When did you first become employed by the Missouri Pacific Railroad Company? A. In 1936.

Q. In what capacity? A. As a brakeman on the Little Rock and Louisiana Division.

Q. Between what points did you work as a brakeman? A. I worked between Gurdon, Arkansas, and Monroe, Louisiana, most of my early career as a brakeman. And I worked from Monroe to Alexandria, and from Alexandria to Little Rock.

Q. How long did you continue as a brakeman for the Missouri Pacific? A. I was promoted to a conductor in 1942.

Q. Did you then commence working as a conductor on a regular basis? [56] A. Not as a conductor on a regular basis. I continued working as a brakeman and conductor, as an extra conductor.

Q. Would you explain to the Court how this part of the railroad labor, seniority situation works, Mr. Shep-

pard? A. When a brakeman is promoted to a conductor, he is the youngest man on the seniority roster of the conductors. He may continue on a regular assignment as a brakeman, and when the services of a conductor are needed, he is called as an extra conductor.

Q. Does that system work likewise in engine service as related to the fireman end engineer? A. Yes, sir, it does.

Q. How long did you continue working as a brakeman and conductor until you received a promotion from those ranks? A. Until 1947.

Q. And what happened in 1947? A. I was appointed assistant trainmaster, Arkansas Division, with headquarters at El Dorado, Arkansas.

Q. During this period from 1936 to 1947 that you were a brakeman and conductor, were you a member of any railroad labor organization? A. Yes, sir, I was a member of the B. of R.T. practically all of that time, and the O.R.C. a portion of the time.

Q. Are those organizations that are intervenors in this lawsuit? [57] A. Yes, sir.

Q. Mr. Sheppard, when you went to work as a brakeman on the Missouri Pacific, what was the brakeman's job? What did he do? A. The brakeman's job was to set out, pick up cars, keep a lookout, inspect trains, set hand brakes, load and unload L.C.L. freight.

Q. You referred to setting hand brakes. What type of hand brakes were on the cars at that time? A. The majority of them were what was commonly known as the staff brake or stem-winder. There were a few Ajax brakes.

Q. I hand you a photograph that I mark PX-91 for identification, and ask you if you can identify the type of brake on that car. A. This is the brake we commonly call the staff brake.

Q. Can you describe to the Court the characteristics of that brake with regard to applying it? A. This brake

consists of a staff extending from the bottom of the car to a position a few inches above the top of the car, with a wheel horizontal to the track on top of the staff, and at the bottom of the staff is a chain, and by applying energy clockwise to the wheel it wraps the chain around the staff, which engages the brake shoe against the wheels of the car.

[58] Q. Was there any gear mechanism in that brake that would provide leverage to the energy that the man applied in turning the brake? A. No gear mechanism, but there is a ratchet on the brake platform which requires that in using this hand brake the employee must use one foot to keep the ratchet applied to the staff.

Q. How does the brakeman, during the period that we have been discussing, obtain leverage in setting that type of brake? A. In many cases on grades, the brakeman carried a brake club, which usually was a maul handle or pick handle. It would be inserted between the spokes of the wheel and against the shaft, and give him leverage on the braking power.

Q. Did you perform that operation when you were a brakeman? A. Yes, sir.

Mr. Light: I offer Plaintiff's Exhibit 91 in evidence.

* * * *

Q. Mr. Sheppard, is that a typical appearance of the staff brake that existed during the period that you were a brakeman? A. Yes, sir, it is.

* * * *

[59] Q. Mr. Sheppard, how does the staff brake compare to the hand brake now commonly in use on the American railroads? A. The hand brake commonly used now——

Mr. Ross: Your Honor, I object to this. After Mr. Light points out the particular hand brake in use today which he is referring to, and Mr. Sheppard's discussion I understand that there are various kinds of hand brakes.

Judge Van Oosterhout: It probably should be made more specific in view of the objection, Mr. Light.

Q. Mr. Sheppard, what type of brakes are used on the, hand brakes are used on the railroads today? A. I believe that there are seven brands commonly in use. [60] The most common ones used by the railroads are the Ajax, the Miner, the Peacock.

Q. Would you describe the characteristics of these brakes as they are compared to the staff brake. A. These brakes have a wheel twenty-two inches in diameter where the old staff brake wheel was sixteen, and it is vertical to the track. On the more modern equipment it is positioned below the center of the car. It is not required that a crew member climb to the top of the car to apply the brake, and it consists of gear mechanism and a drum which does not require too much effort on the part of a person to effectively apply the brakes.

Q. How does the effort to effectively apply this brake compare with that required on a staff brake? A. It in most cases is not difficult to apply this brake with one hand sufficiently to slide the wheels on a car.

Q. Have you done that? A. Yes, sir.

Q. Mr. Sheppard, during the time that you were a brakeman, was L. C. L. freight handled by the train crew? A. Yes, sir, to a great extent.

Q. What is L. C. L.? A. That is less carload shipment.

Q. To what extent did the train crew handle such merchandise [61] during the time you were brakeman? A. On the local run between Gurdon and El Dorado, Arkansas, the train would handle from one to three cars of L. C. L. merchandise every trip. They wouldn't necessarily unload the entire car. They would unload and load from three different cars.

Q. Whose job was it to do the loading and unloading? A. The brakeman's, except that at stations where there were warehouse force employed. They assisted.

Q. Can you give us some idea what proportion of the

stations would have warehouse forces? A. Between Gurdon and El Dorado, at that time there was warehouse forces at Camden, one at Smackover, and that is all, with the exception of several agents, one-man agents.

Q. Mr. Sheppard, would you tell us how L. C. L. freight was handled at that time with relation to the station switching that was done, at the particular stations. A. Quite often the crew would spot the merchandise cars to the freight house door or to the platform, and the agent and the warehouse force, if any, would assist one or two crew members in unloading the L. C. L., while the other crew members performed the station of switching. This was not true in every case, but it was not uncommon.

Q. I believe this is the first time we have mentioned station [62] switching. Would you briefly describe to the Court what that amounts to. A. Station switching is the picking up and setting out of cars on auxiliary tracks.

Q. What size crews were these that you were a brakeman and conductor on during the 1936-1947 period? A. Six-man crew.

Q. Did you ever work outside the State of Arkansas during that period with a lesser crew? A. Yes, sir, I made some trips to Louisiana with a five-man crew.

Q. On what type of train? A. On branch line locals and on through freights.

Q. Was the work done by both trains comparable to that done by similar trains in Arkansas on which you also worked? A. Yes, sir, it was.

Q. Was the work accomplished by the five-man crew in Louisiana during the time that you were on those runs? A. Yes, sir.

Q. Were there any accidents or injuries in connection with those five-man operations that you recall? A. I don't recall any.

Q. How is L. C. L. freight presently handled? A. On

the Missouri Pacific it is all handled by truck or piggy-back except some of it is handled in cars, but not [63] unloaded except at terminal points by the clerical forces.

Q. How long has it been since the train crews on the Missouri Pacific were required to load or unload L. C. L. freight? A. It was phased out gradually, but I believe the last of it was discontinued about ten years ago.

Q. What size merchandise was involved with this L. C. L. freight? A. Anything from a pound up to several thousand pounds, and, of course, we loaded and unloaded some cotton which were 500 to 550 pounds a bale.

Q. Bales of cotton? A. Yes, sir.

Q. Mr. Sheppard, when you went to work in 1936 as a brakeman, what did the fireman do on the Missouri Pacific locomotive? A. He fired the engine mainly.

Q. What type of motive power did you have on your railroad at that time? A. It was all steam power.

Q. What type of motive power do you have on your railroad now? A. It is all diesel electric.

Q. Do you know whether or not there are any railroads operating in Arkansas that are operating with steam locomotive today? A. The Reeder Railroad is the only one that I know of.

[64] Q. How long has it been since the Missouri Pacific operated steam locomotives? A. 1955.

Q. Mr. Sheppard, in general how did the work done by the crews on those steam-drawn locomotives in the 1936 to 1947 era compare with the work done by those crews now with regard to the number of stops that are made between stations? A. During that period there were very few good roads, and on this particular area that I was working on there were a number of open stations that are no longer in existence. In addition to that, there were spur tracks every few miles where pulp wood or cross-ties, logs, so forth were loaded. And the local stopped and picked up and set out cars at all of these switches.

Q. How has that affected the work of the present train crew? A. Well, it requires many less stops and, of course, when you eliminate a stop you eliminate the cutting off of cars, the throwing of switches, and the coupling of cars.

Q. Has there been any changes of the operating rules on the Missouri Pacific since you came to work on the railroad that has materially affected the work of the train crews? A. Yes, sir, a number of changes.

Q. Tell the Court what changes there have been and what has been the effect in each instance on the work of the train crew. [65] A. One of the major changes is the elimination of brassing cars that develop hotboxes. That used to be a rather common occurrence, and that was discontinued a number of years ago. One of the major operating rules changes is in rule 99, the flagging rule.

Q. Would you explain what the flagging rule was when you went to work on the railroad and what is it now. A. Well, when I went to work on the railroad the train stopped under circumstances in which it may be overtaken by another train, a flagman protected to the rear of the train immediately. And if the train was moving under circumstances in which it may be overtaken, you provided flag protection. The rule has been modified to the extent that in A. B. S., Automatic Box Signal territory, and C. T. C. territory, if there are as many as two block signals to the rear of the train, it is not necessary to provide flag protection when the train is occupying the main track.

Q. Would you describe in the lay language what having two block signals to the rear of the train means. A. Well, block signals are lights which indicate if the block is clear, or is occupied, or if there is a broken rail, and they are spaced from a mile and a half to three miles apart ordinarily, and if there are two block signals to

the rear that is adequate protection against the following [66] train because the blocks will be stop indication.

Q. Why will they be at stop indication? A. Because the train on the main track will shut the circuit and actuate the block.

Q. How has this modification of Rule 99 affected the work of the train crew with regard to the number of them available to do the work on the train when it stops at a station? A. It makes one more man available. Instead of flagging, he is available to perform any other service that may be, needs to be performed.

Q. Is all of the Missouri Pacific track in Arkansas either C. T. C. or A. B. S. signalized? A. No, sir, it is not all A. B. S.

Q. What other type of train movement regulations do you have other than those two systems in Arkansas? A. Well, we have a form "Y" train order which relieves the train from protecting when this order is issued to the train. It sets up waits to the rear of the train, and if there is no other train due, the order will indicate that, and it is not necessary to flag. On other subdivisions and covered by general notice, it is not necessary to provide flag protection unless issued a train order specifically instructing that it be provided.

Q. Mr. Sheppard, what proportion of the trains operated daily [67] during the 24-hour period by Missouri Pacific Railroad Company in Arkansas would be relieved of providing flag protection to the rear by one of the occasions that you have described either by C. T. C. or A. B. S. or Form Y Train Order or general? A. It would vary from day to day. I expect not more than three or four would have to provide flag protection during a 24-hour period.

Q. You mentioned that hotboxes were rebrassed by the train crew during the early days of your railroading. Is that correct? A. That is correct.

Q. Would you tell the Court what is involved in pre-

paring a rebrassing a hotbox? A. The equipment used is ordinarily a three inch block, ten inches wide and some twenty-four or twenty-six inches long, and a journal jack and a jack handle clamp to clamp the wheel to the rail. The crew jack up the car sufficiently to remove the damaged brass, apply a new brass, a new packing, new oil, and service it for further movement.

Q. You mentioned that a jack was used to jack up the car. A. Yes.

Q. Do you recall what that sort of jack weighs? A. The old cast iron jack, I believe, weighed around between [68] fifty and sixty pounds. Then later they got the aluminum jack which weighed about twenty-six pounds.

Q. Is this no longer the practice of the train crew, rebrassing a car out on the line? A. No, sir. In fact, it is not permitted.

Q. Are the trains equipped with a jack and other paraphernalia necessary to do this work now? A. There are brassers on locals to boosters only. The jacks have been discontinued.

Q. Who does the work of rebrassing hotboxes now? A. The mechanical forces.

Q. How many men were required to do that work out on the line at the time when it was done by the train crew? A. Usually two men did it.

Q. Mr. Sheppard, is this something you have done—rebrass the hotboxes on the line? A. I have seen it done. I never rebrassed one myself.

Q. Would you describe just briefly what a hotbox is. A. A hotbox is an overheated axle on a car. That is caused by a breakdown in the lubrication or some foreign matter in the bearings. And as a result of friction the axle becomes heated, and the more heated it becomes the more the lubricant breaks down, and eventually if attention isn't given it will become red-hot and it will break off.

[69] Q. What can be the result? A. It can be a derailment if it completely fails.

Q. Were hotboxes a problem when you went to work on the railroad? A. They were a problem. We had numerous hotboxes, and the local ordinarily would gather up the hotboxes that the through freights had set out, and try to nurse them into the terminal, if the brass was not too bad.

Q. How does the instances of hotboxes today compare with the instance at the tin you went to work on the railroad? A. We still have some hotboxes, but very few compared to the time when I went to work.

Q. What factors have contributed to decline in the hotboxes? A. The improved lubricant. We have discontinued the use of ordinary oily waste, and the car is equipped with journal brass now are equipped with lubricater pads which are made of sponge rubber and chenille material. The greatest improvement is with the roller bearings to replace the old friction bearings.

Q. What is the status of the replacement of friction bearings by roller bearings? A. It varies on different railroads. I don't believe the Missouri Pacific has acquired any new cars in the last two years without roller bearings.

[70] Q. How were hotboxes guarded against or what effort was made to discover them at an early time during your first years on the railroad? A. The crew members kept a constant lookout while in motion, and at every stop if they had the opportunity some members of the crew would walk the train, or as much of it as possible, to make an inspection. And it was common practice for some of the conductors to require the brakeman to put his hand on every box as he walked by.

Q. Is there any method that has since that time been adopted for discovering and detecting hotboxes? A. Yes, sir. There are hotbox detectors that are placed at stra-

tegic locations which will register at a central point if a journal is becoming overheated.

Q. Is that equipment installed on the Missouri Pacific Lines in Arkansas? A. Yes, sir.

Q. Where are the detectors in Arkansas? A. We have two in Arkansas at the present time—one at Mabelvale south of Little Rock, and one south of McGehee, Arkansas.

Q. With respect to the hotbox detector at Mabelvale, that examines cars that are destined to where? A. For Little Rock.

Q. And the North Little Rock yard? [71] A. North Little Rock yard.

Q. Where does the information that it records actually come out of the machine for the examination of an employee? A. In the car foreman's office at North Little Rock.

Q. Mr. Sheppard, when you first went to work for the railroad, what was the practice with regard to a freight train crew making up its own train? A. There was several different practices with very little rule involved, but it was not uncommon for the conductor to be given a handful of weigh bills with no list at a place like Gurdon, Arkansas, and he would start at Smithson, two miles north of Gurdon and switch all the way through the yard to a point a mile or mile and a half south of the depot gathering up his train. It was necessary that he locate the cars by checking them against the weigh bills and then switch them out into his train.

Q. Did it make any difference in which particular order he would put them in the train? A. Well, for his own convenience, he switched them in station order, because if he didn't on his trip after he left the terminal it had to be done at some other point.

Q. What reports did the conductor prepare in connection with that operation and in connection with moving a train on assignment at that time [72] A. At that time the

conductor had practically the same delay report or time slip, it is a combination time slip-delay report, and in addition he had the wheel report which we have today, but in most cases the conductor was required to wheel the cars in their entirety, where today at the initial terminal the clerical force makes the wheel report.

Q. Mr. Sheppard, who makes up the trains at the initial terminal now? A. Where there are yard engines employed, the yard engines do.

Q. Does the train crew have any responsibility in connection with making up the trains in those instances? A. Not in those instances, no, sir.

Q. What proportion of the Missouri Pacific freight trains run in Arkansas in a twenty-four hour period day would leave initial terminals where they had been made up by the yard forces? A. All of them except a few locals. I don't believe there are any through freights that are not made up by yard forces.

Q. You mentioned delay reports. Mr. Sheppard, I will ask you if the instrument I have marked PX-92 isn't a copy of a completed delay report. A. Yes, sir.

Q. What train is that? [73] A. This is Train Number 735 between North Little Rock and Texarkana.

Q. Does that train have a name given to it by the employees that work on it? A. It is commonly referred to as the Long Barrel Local.

Q. What does that name denote? A. I take it they mean that it is one of the longest mileage local runs on the division.

Q. Is it one of the longest mileage local runs on your, in your jurisdiction in Arkansas? A. It is one of them, yes, sir.

Q. Is that a typical delay report with the typical information that a conductor writes? A. Yes, sir.

Mr. Ross: I object to that as being a leading question, and tends to suggest an answer.

Judge Van Oosterhout: All right, go ahead.

Q. Mr. Sheppard, when does a conductor fill in the information contained in that report? A. The information at the top of the report or the heading can be filled in before he leaves the terminal, as soon as he finds out the time he is called and what train he is called for, and what engine number you have.

[74] Q. When is the balance of the information filled in? A. The balance is filled in when stops are made which result in the delay or when cars are picked up and set out.

Mr. Light: I offer Plaintiff's Exhibit 92 in evidence.

* * * *

Q. Do you happen to know where this Long Barrel Local that Plaintiff's Exhibit 92 relates to has been mentioned in the testimony introduced by Mr. Ross this morning? A. Yes, sir, it has.

Mr. Ross: No objection to it being introduced.

Mr. Lessenberry: No objection.

Judge Van Oosterhout: It will be received.

* * * *

Q. During your early days of railroading, who made up the wheel report? A. The conductor did in most cases. At times if the train originated where a clerk was employed, the clerk would make up the wheel report.

Q. How extensive a piece of work was making up the wheel report? [75] A. It was rather time-consuming if necessary to make it in its entirety. It would probably take about two minutes per car to strike the information from the weigh bill and transfer it to the report.

Q. Who makes up the wheel report, initial wheel report in the terminal now? A. The clerical force.

Q. I hand you what has been marked Plaintiffs' Exhibit number 93 and ask if you can identify that. A. Yes, sir, this is a wheel report on a train between Texarkana and North Little Rock.

Q. And by whom was that prepared? A. This was prepared by the clerical forces, apparently, at Texarkana. There is no way to determine exactly where, except it was prepared on the IBM equipment, and it shows the stations from X491 which is the Texarkana station number.

Q. What responsibility did the conductor have with regard to that wheel report? Did he have to do anything on it? A. Yes, sir, he made a brief entry on the top line which showed the date, the station number, which was the destination of the run, and the time, and shows his name.

Q. Is that the only entries that it was necessary for the conductor to make on the wheel report? A. There is one other entry, on the first car of each sheet he shows X491, which is the station number for Texarkana, [76] and the station number left X-344, which is North Little Rock, 3-16 for the date, and he drew a line down the entire page ditto of the sheet.

Q. Is there anything unusual about Plaintiffs' Exhibit 93 for identification that would not make it typical of the wheel report that is commonly in use on your railroad? A. No, sir. This is typical of the wheel report on freight trains.

* * * *

Mr. Light: Very well, then, I offer Plaintiffs' Exhibit 93 in evidence.

* * * *

[77] Q. Is there any difference in the way the conductor handles his weigh bills now from the way he handled his weigh bills when you were a brakeman and conductor? A. Now the conductor is given his weigh bills lined up in the order which they stand in the train, and he makes a switch list from the weigh bill, which consists of the car initial and the number.

Q. Is it necessary for him to go examine the car or get any information off the car to do that? A. No, sir, the clerical force at the initial terminal line up the bills, and if

for some reason they line the bills incorrectly, the conductor is not responsible.

Q. Was the conductor supplied with his weight bills in train order during your early days of railroading? A. On rare occasions there was some attempt to do it, but they were not consistently lined up.

Q. Are there any other documents that the conductor regularly prepares day in and day out in the operation of a freight train other than the two exhibits we have just referred to? A. That is the only regular report.

Q. You referred last to the switch list. Is that correct? A. Yes, sir.

Q. I hand you an instrument that I have marked for identification as PX-94 and ask if you can identify that. [78] A. Yes, sir, this is a switch list of the same train covered by the wheel report which I examined.

Q. When during the tour of duty on that train could the conductor have prepared that switch list? A. He could have before he left his initial terminal, which was Texarkana. There is no way to determine when he did it. If he didn't have time to do it then, he had time to do it after the train left when he got on the caboose.

Q. Are there facilities on a caboose for doing paper work? A. Yes, sir, there are.

Mr. Light: We offer Plaintiffs' Exhibit 94.

* * * *

Q. Are there other reports that on occasion a conductor must prepare? A. Yes, sir, there are other reports that cover unusual conditions.

Q. What sort of conditions? A. There is a hotbox report that a conductor prepares in the event he sets out a hotbox. There is an eighteen report the conductor prepares if he sets out a redball load that order. There are register tickets which conductors may use to register in lieu of stopping the [79] train and going in the register station to register on the register book.

Q. Mr. Sheppard, how would you compare the paper work now done by a conductor on a freight train on the Missouri Pacific in terms of the time required with the paper work you did as a conductor on the Missouri Pacific when you were so employed? A. Much less time-consuming, and mainly due to the wheel report being prepared by other employees.

Q. What is the conductor's responsibility with regard to the switching operation? A. The conductor is responsible for protection of his train, for the operation.

Q. Was that likewise true when you were a conductor? A. Yes, sir.

Q. Did you ever find that your paper work kept you from exercising your responsibility for the switching operation? A. At times I was very hard pressed to do the paper work and still supervise the switching.

Q. You have mentioned that the weigh bills are lined up by terminal forces in train order. What is the practice with regard to blocking trains in station order now? A. Where a train is made up in the terminal by a yard engine if there are any short cars, that is, cars to be set out between terminals, it is required that they be blocked in [80] station order, to eliminate switching on line of road.

Q. What was the practice when you first went to work on the railroad in that regard? A. There was some attempt made to line up the train, but it was not done with any frequency.

Q. Is there now any difference in the number or portion of train run from station to station without picking up and setting out as compared with your early days of railroading?

Mr. Ross: I object. Will he confine his answer to the El Dorado-Gurdon run on which Mr. Sheppard operated as a conductor.

Judge Van Oosterhout: Well, I suppose that he should go into it far enough to show that he had the experience,

the knowledge to answer beyond his experience, if you want to go beyond that, Mr. Light, as to what happened on his particular trains.

Q. Would you confine your answer to this question to your own observation and experience in the territory of where you worked as a brakeman and conductor. A. Alright.

Q. And also with regard to the same situation your observation and experience as General Manager observes his railroad company in Arkansas.

Mr. Light: Does that meet with your objection?

[81] Q. May I re-ask the question—Mr. Sheppard, have you observed whether there is any difference in the number of trains that are presently run in your jurisdiction between stations without picking up or setting out, and the number of trains that were run in the areas where you had an opportunity to observe this practice as a brakeman and conductor? A. It would be difficult to make a comparison. However, we operate numerous trains today that do nothing from St. Louis or Dupo, Illinois, to Texarkana but change crews.

Q. Can you state whether there or more or less trains operated between stations without stopping now as compared to your experience in your earlier days of railroading? A. I can't make an accurate comparison, but I do know that during that period of time they all stopped, at least to take fuel or water, and with the number of sidings and spur tracks and stations, the station work, there was much more station work to be done by someone.

Q. You mentioned taking fuel and water, I hand you what I have marked PX-95 for identification and ask you if you can identify what that picture shows. A. This picture shows a coal chute and a water tank with an engine on the track which runs under the coal chute.

Q. Are those structures that you were familiar with in your early days of railroading? [82] A. Yes, sir.

Q. Are they typical of the structures that were located on the railroads in Arkansas? A. Yes, sir. They were not all of the same design, but they——

Q. How did the use of those facilities affect the work of the train crew? What did they need to do with those facilities? A. The trainmen didn't have anything to do with these facilities. Ordinarily when, unless they voluntarily helped the fireman take fuel and water, which was not the responsibility. Ordinarily, they inspected the train when they made a stop to take fuel or water.

Q. I expect at this point you had better explain the difference of railroad terminology of train crew and engine crew. A. Well I, of course, refer to the engine crew as the engineer and fireman, and the train crew as the conductor and the brakeman.

Q. All right, and what did the engine crew do with these facilities? A. The engine was spotted underneath the coal apron or the water spout, whichever the case may be, sometimes both, and the fireman went to the back of the tank to take water, lifted the cover on the tank, pulled the water spout down, inserted it in the tank, pulled a rope or chain to release the water and fill the tank. On the coal chute, he lowered [83] the apron to the coal tinder and pulled a rope or a chain to release the coal in the coal pocket until he filled the coal tinder.

Q. At what intervals along the railroad right-of-ways were those structures maintained? A. Water tanks in many cases, every fifteen to twenty miles, and coal chutes ordinarily at division points.

Q. Did all trains stop at each water tank, or every other one, or what was the practice? A. Well, it was very seldom that an engineer would go by a water tank without stopping, even though he was running light. Occasionally, if the tonnage was light he may run one water tank.

Q. Do you have any of these structures on the Missouri Pacific Railroad Company now? A. Not to my knowledge; there are none left.

Q. How far is a diesel locomotive capable of running before stopping for fuel, water or some other material needs to get it over the road? A. We run diesel locomotives from Dupo, Illinois, to Texarkana, a distance of 491 miles, and I believe in many cases they continue for another hundred without fuel.

Q. I hand you another instrument marked Plaintiffs' Exhibit 96 and ask if you can identify that. [84] A. This is two steam locomotives apparently coupled.

Q. The crew is doing what? A. Looks like one of the crew members is standing on the ground and one sitting in the, on the engineer's seat box.

Q. Is that typical of the scenes you observed as a brakeman on the railroad company? A. Yes, sir.

Mr. Light: I offer Plaintiffs' Exhibits 95 and 96 into evidence.

* * * *

Q. Mr. Sheppard, where does the so-called head brakeman ride on a locomotive under current practice? A. He rides the lead unit.

Q. And performs what service on that unit while the train is moving? A. He performs lookout service.

Q. Where did the head brakeman ride in steam locomotive days? A. Some steam locomotives had a dog house on the tinder which would accommodate two men, and if equipped with a dog house he ordinarily rode the dog house.

Q. I hand you a composite picture I have marked Plaintiffs' Exhibit 97, and ask you if you can identify each of the three scenes shown on it. A. On the right side is the engineer on the engineer's seat box, [85] in the center is a train crew member in the cupalo looking out of the window on the right side.

Q. Cupalo of what? A. Cupalo of the caboose.

Q. What is in the upper left-hand section of that picture? A. That is a trainman, or appears to be a trainman,

he is in the trainman's dog house, or trainman's cabin, looking out the window on the engineer's side observing to the rear.

Q. Is that what you refer to as the dog house earlier? A. Yes.

Q. Why didn't that man ride in the cab of the steam locomotive? A. Well, probably because there was no seat in the cab since the engine is provided with a brakeman's cabin or dog house on the tinder.

Q. Is there visibility forward of the train from these dog houses? A. No, sir.

Mr. Light: I offer that, Your Honor, as Plaintiffs' Exhibit 97.

* * * *

Q. Mr. Sheppard, have there been any changes in communications in railroading that have affected the jobs of train crews since you were a brakeman and conductor? [86] A. Yes, sir. The major change is the installation of radio equipment, two-way radios on engines, cabooses, wayside stations and dispatchers' offices.

Q. In your early days of railroading how did the people in the caboose communicate with people on the head end of the train? A. By hand or lamp signal.

Q. Are radios now installed on Missouri Pacific locomotives and cabooses? A. Yes, sir, on the A units and the general purpose units, and on the cabooses.

Q. With whom can the train crew communicate by the use of those radios? A. They can communicate with each other, they can communicate with the dispatcher, and with the agent operators at points where there is a base station.

Q. What is your experience with regard to the reliability of those radios on the locomotives and cabooses? A. They are very reliable. Of course, at times they will malfunction or become unoperative. However, we have maintainer stations at strategic locations that check the radios

when they come in and make repairs. They also make road trips to outlying points to repair radios.

Q. How many maintainers do you have employed full time for the radio equipment in Arkansas on the Missouri Pacific? A. We have two at North Little Rock, we have two at Memphis [87] that perform other duties, but they are radio repairmen, and of course, while they are stationed in Tennessee, all of the trains that we operate out of Memphis across the river into Arkansas.

Q. Do you have occasion to personally use one of these radios on the same frequency that the caboose and locomotive radios are on? A. Yes, sir, I have one on a highway rail automobile that I use.

Q. What is a highway rail automobile? A. That is an automobile equipped with rail wheels that can be operated on both, on either the rail or the highway.

Q. How long have you had a radio installed in the car that you use? A. About five years.

Q. Have you had any difficulty with it? A. I had a tube or a transistor burn out one time.

Q. What did you do, Mr. Sheppard, when you ceased being a conductor in 1947? A. I was appointed assistant trainmaster at El Dorado on the Arkansas Division.

Q. How long did you continue? A. A little over three years.

Q. And then what promotion did you receive? [88] A. Trainmaster, the Illinois Division, at Bush, Illinois.

Q. Now, we have got some twenty or thirty trainmasters and assistant trainmaster testifying in this case. Would you describe with some particularity the duties of a trainmaster and assistant trainmaster. A. An assistant trainmaster reports to a trainmaster and performs practically the same type duty as a trainmaster. They are responsible for the train operations, the yard and the station operations on their territory.

Q. In the performance of these duties do they ride the

trains? A. Yes, sir, they should ride trains frequently, and do.

Q. What are the duties of a road foreman of engines? We also have many of those testifying in this case. A. Road foreman of engines duties consist of instructing the engineer crew on proper handling of the engine and brakes, instructing him on new equipment, check the engines, determine if there is any work needed on the engines, report the fact to the terminal in order that the mechanical force can make necessary repairs or adjustments.

Q. Mr. Sheppard, did you participate in any way in the preparation of what has been introduced as Plaintiffs' Exhibits numbers 1 through 17, this being the testimony of Missouri Pacific road foremen and trainmasters concerning the study made in 1966? [89] A. I didn't participate except to this extent. I was instructed to get the checks made, and made quickly, and I passed the instructions on to the superintendents who handled directly with the trainmasters and road foremen to get it done.

Q. Have you examined Exhibits 15, 16 and 17, which are charts listing the trains that were actually ridden by these men and reported on in their testimony? A. Yes, sir.

Q. Do you have an opinion as to whether those trains that they rode and reported on represent a fair cross-section of the Missouri Pacific operation in Arkansas? A. Yes, sir, they would.

Q. How long did you continue as trainmaster in Bush, Illinois? A. I was there about a year and a half.

Q. And then where did you go and in what capacity? A. Poplar Bluff, Missouri, as trainmaster.

Q. How long did you continue at Poplar Bluff? A. A little less than a year and a half.

Q. And from there you went where? A. To Little Rock, Arkansas, as trainmaster of the South end of the Arkansas Division.

Q. What segments of the Missouri Pacific Railroad Com-

pany did you have under your jurisdiction as trainmaster at Little Rock? [90] A. From Little Rock to Texarkana, Gurdon to El Dorado, Hope to Nashville, Gurdon to Norman, Benton to Hot Springs, and Benton to Pine Bluff.

Q. When you left Little Rock on that occasion where did you go and in what capacity? A. I went from there to Pueblo, Colorado, as Assistant Superintendent.

Q. What were your duties as Assistant Superintendent? A. Mainly to take care of the west end of that particular division for the superintendent who was stationed in Osawatomie, Kansas. We did not have a trainmaster there, so my duties were similar to the trainmaster duties with added superintendent's work.

Q. Did your duties involve riding the trains? A. Yes, sir.

Q. To what extent? A. I rode trains quite often on that territory. Probably two or three a week.

Q. During your time as assistant trainmaster and trainmaster then Assistant Superintendent, where did you ride the trains when you rode? A. Either on the engine or the caboose.

Q. Where did you go from Pueblo, Colorado? A. I went to Nevada, Missouri, as Assistant Superintendent on the Joplin-White River Division.

[91] Q. This was when? A. This was 1959, I believe, or 1960.

Q. What segment of the Missouri Pacific track in Arkansas was under your supervision while you were Assistant Superintendent at Nevada, Missouri? A. From Newport, Arkansas, to the Missouri state line.

Q. Did you run through freight trains over that line? A. Yes, sir.

Q. What size crew did you use to run that through freight train from Newport, Arkansas, to Nevada, Missouri? A. We used a six-man crew to Crain, and a five-man crew west of Crain.

Q. All right, now where is Crain? A. It is about fifty-five miles from the Missouri-Arkansas state line.

Q. And a southbound train would do what at Crain? A. A southbound train would pick up a third brakeman, commonly referred to as a law brakeman.

Q. And then proceed on into where? A. To Cotter.

Q. Cotter, Arkansas? A. Cotter, Arkansas.

Q. Was a stop made at Crain for any purpose other than to pick this man up? [92] A. It is possible that it was. I couldn't say there wasn't some other reason to stop on some occasions, but if there was no other reason, they still had to pick up the man.

Q. What did a northbound train do with reference to Crain? A. They left off the third brakeman at Crane.

Q. Do you recall whether the practice when you were there was to stop the train for the purpose of taking the man off and on, or whether the practice was to slow it for that purpose. A. I can't definitely say whether they completely stopped or slowed down.

Q. On this through freight train operating between Nevada, Missouri, and Newport, Arkansas, was Crain a terminal where crews were changed? A. No, sir, I am sure it wasn't.

Q. What were the two terminals on either end of that run where the crews changed? A. At Cotter and Nevada, Missouri, I believe.

Q. It is obvious. Why was the man put on the train? A. To comply with the Arkansas law.

* * * *

[93] Mr. Light: I now offer into evidence Plaintiffs' Rebuttal Exhibits numbered 1 through 35 with the exception that there is no number 28 that corresponds to the number of the witnesses' testimony that was withdrawn by the Intervenors this morning, PRX-1 through PRX-35, this is the cross-examination of the operating employees.

* * * *

[94] Q. Mr. Sheppard, where did you go from Nevada, Missouri? A. Poplar Bluff, Missouri.

[95] Q. And did you later serve somewhere else as superintendent? A. Yes, sir, Palestine, Texas.

Q. And when did you leave Palestine and go where? A. 1962 I moved from Palestine to Little Rock as Assistant General Manager, Southern District.

Q. And when did you become General Manager of the Southern District? A. 1964.

Q. How do you keep apprised of the railroad operations and what is going on on the Missouri Pacific in the territory under your jurisdiction? A. By making periodical inspections of the territory and by reports which we receive.

Q. To what extent do you travel the territory under your jurisdiction day in and day out? A. I try to spend about half of my time on the road.

Q. You mentioned this morning the high rail car. Is that one form of transportation you use to get around on the system? A. Yes, sir, that is correct.

Q. What reports do you receive daily, Mr. Sheppard, concerning the operations of the railroad under your jurisdiction? A. I receive a morning situation report that is available about 6:30 a. m. It covers the operation of all of the [96] trains for the previous twenty-four hour period.

Q. What does it show about the operation of the trains? A. It shows the number of cars, the engines, the departure from terminals, the arrival at terminals, delays, hotboxes, if any, any unusual occurrences.

Q. What sort of wire reports do you get? A. I get wire reports on all personal injuries, regardless of whether or not they lost time, and wire reports of any major delay or accident.

Q. Does that include crossing accidents? A. Yes, sir.

Q. Mr. Sheppard, how many employees of the railroad

company work under your general supervision? A. Between 5,000 and 6,000. It varies from time to time.

Q. Mr. Sheppard, at my request have you read the transcript of the record in the case of State of Arkansas versus Chicago, Rock Island and Pacific Railway Company, being the report of the trial conducted on November 18, 1907, in Pulaski Circuit Court? A. Yes, sir.

Q. Is this a copy of the instrument that you read? A. It appears to be.

Mr. Light: Your Honor, I offer Plaintiffs' Exhibit 98, which is a copy of the record taken from the files of [97] the Supreme Court of Arkansas Clerk of the 1907 case testing the validity of the 1907 crew consist law.

* * * *

Mr. Ross: Your Honor, we object to the admission of this document in evidence on the grounds that is immaterial to the issue before the Court. The only issue before the Court is the changes of conditions, the changes that occurred subsequent to the Norwood decision in 1933, 1931 and 1933. And on the additional ground that the comparative facts, which I presume this report would lay a ground work for, are the facts that are found by the Court to be significant, not the facts which were introduced and found to be insignificant to the ruling of the court. It is an undue burden of the record to add this kind of document to it, in view of the fact that we have extensive summary of the facts which the Courts previously have relied.

Judge Van Oosterhout: In this matter and other matters the Court will receive the exhibits under a reserve ruling, and the matter can be explored further in brief and argument if desired.

[98] Mr. Lessenberry: Note the objection of the defendants also.

Q. Mr. Sheppard, at pages 419 and 420 of the official report of the Supreme Court of Arkansas in its decision

on appeal in that case, the Court lists seven items that it considered, as Mr. Youngdahl said, significant in supporting the validity of that legislation. I am going to inquire of you about the current situation on each of these seven items that was reflected in that record in 1907. Was there testimony, or is there testimony in Plaintiffs' Exhibit 98 to the effect that due to changes in equipment and methods of operation much of the conductor's time was taken up with making his reports thereby preventing him from giving much time to the physical handling of the train? A. Yes, sir.

Mr. Youngdahl: If the Court please, we will stipulate that there was testimony in the record to the extent that the Court in its decision said there was testimony in the record, which appears to be all that counsel is asking. And if we can avoid a series of questions on that by such stipulation, we offer to do so. Secondly, I was wondering if I could have a continuing line of objections to testimony concerning the 1907 case, in that it is developed since the 1930 case of Norwood, which seems to us to be material.

Judge Van Oosterhout: Your objections certainly may stand as to all the line of questioning with respect to the 1907 [99] case. So that it need not be renewed with each question. With respect to the rest, we will permit it under the reserved ruling.

Q. Mr. Sheppard, how does the circumstance concerning the conductor's paper work as revealed in the testimony in the 1907 record compare with the conductor's paper work under present practices? A. The amount of time consumed in paper work at the present time is so small that he is available most of the time to perform other duties.

Q. Does the testimony that due to increased car capacity, tonnage, number of cars in train, and increased engine power, there was increased amount of work for

the brakeman to do, although they were required to stop trains in emergencies also? A. Yes, sir.

Q. What is the present practice with regard to brakemen stopping trains in emergency? A. There is no occasion or no requirement for brakemen to stop a train in an emergency except by use of the air brakes in the event some other crew member fails to function.

Q. How would he use the air brakes? A. Well if he is on the engine he would have available the engineer's brake valve or the brake valve on the other side of the engine. On the caboose there is a brake valve which [100] is commonly referred to as the conductor's valve, from which the brakes may be applied. And also on the platform of the caboose there is another valve that can be used.

Q. Now, how does that compare with what these brakemen did in 1907 in emergencies in stopping the train? A. In 1907 they were required to assist in stopping the train by use of hand brakes.

Q. With respect to the other portions of this assertion that due to increased car capacity, tonnage, number of cars in trains and increased engine power, there was increased amount of work for brakemen to do, how does that condition as it then prevailed as reflected by the 1907 record compare to the present circumstances? A. Well, that did not increase the work for the brakemen, because of the improvements in the rails, the roadbeds, the equipment, and the conditions in general are such that the third brakeman is nothing more than a passenger lots of times.

Q. Is there testimony in that record that it was a daily occurrence for draw-heads to pull out requiring the services of two and three men to promptly chain up the cars? A. Yes, sir.

Q. How frequent occurrence is it now for draw-heads to pull out? A. On my daily report there will be many,

days that there is [101] not a draw-head pulled out on the Southern District.

Q. How many trains run in a twenty-four hour period in the Southern District? A. Approximately sixty.

Judge Van Oosterhout: Would you have the witness explain that a little. I know nothing about railroading. I don't know what a draw-head is.

Mr. Light: I surely will, Your Honor.

Q. How many different crews are working on those sixty trains during a twenty-four hour period? A. Well, that is approximately sixty crews. For instance, it will take three crews to take a train from Dupo, Illinois to Texarkana.

Q. Yes, sir. Are you counting that as one train in your sixty? Although you have three separate crews. A. I am counting that as three.

Q. Now, would you explain to the Court briefly what happens when a draw-head pulls out. What is that situation? A. When a draw-head pulls out, of course, a draw-head is the mechanism on each end of a car for coupling the cars together. If a draw-head pulls out it either falls to the ground or it becomes weakened to the extent that it will not pull the car, in which case the draw-head has to be removed from the track, if it is in the track, and if it is still hanging by some of the attachments, it ordinarily [102] has to be cabled up so it will not fall off.

Q. Did one of the witnesses who testified in the 1907 trial testify to a greater frequency than once a day to draw-heads pulling out? A. Yes, sir.

Q. What frequency did he testify that event occurred? A. I believe he said about three a day.

Q. What is done under present day circumstances when a draw-head pulls out by the train crew to remedy the situation? A. They have a flexible cable on the engine and caboose, and if the draw-head is out of the end next

to the engine, they have to cable it to the live end of the train and set it out at the first switch. If the draw-head is out of the opposite end they merely run up to the first switch and shove it in the clear and set it out.

Q. How many men does it take to handle the cabling up of a car? A. Two men can do it very easily.

Q. How much does this flexible cable weigh? A. About forty-four pounds.

Q. In the testimony of 1907 was the term "chains" used? A. Yes. And chains were in use for many years after that.

Q. Up until about when, Mr. Sheppard, did Missouri Pacific abandon the use of chains for this purpose? [103] A. It has been within the past ten years.

Q. How much did the chains weigh that were used for this purpose? A. The chains weighed about three times the weight of the cable—a hundred and some odd pounds.

Q. How many men does it take to push or roll a pulled draw-bar off of the track and over the rails? A. One man could possibly do it, but it really should take two because of the weight of the draw-bar.

Q. Every time a draw-bar pulls, must it be removed from the right-of-way? A. Not by the train crew. They never remove them from the right-of-way.

Q. I didn't ask the question very well. Does the draw-bar sometimes remain attached to the car and not fall? A. Yes, that is correct.

Q. And what is done in that event? A. It is set out with the car, in some cases it has to be tied to the car to keep it from falling off.

Q. Mr. Sheppard, was there testimony in the 1907 record that when a train would stop between stations it was required that a brakeman be sent to the rear of the train and frequently required to send another forward to flag approaching trains, and since safe operations and the [104] rules of the company required the engineer, and

fireman to remain at their post, only the conductor was available to perform any required work on the train in this situation? A. Yes, sir, that was the testimony.

Q. What is the current situation when a train is stopped between stations with regard to any requirements of the engineer or fireman remaining at their posts? A. There is no requirement for either or both of them to remain at their post.

Q. Was there a reason for the fireman to stay at his post on a steam locomotive? A. Yes, sir, he had to watch his fire and his water level.

Q. Is there anything for him to do on a diesel locomotive? A. Ordinarily there wouldn't be anything. I don't think of anything that would require him to stay on the diesel.

Q. Very briefly, you touched on it this morning, what is the present situation with regard to having send a brakeman to the rear of the train to flag when the train is stopped between stations? A. About the only occasion would be on a double main track, if the train was stopped in an emergency, it would be necessary to protect the adjacent track until it was determined if the adjacent track was foul. The emergency stop could have resulted from a derailment which could have fouled the adjacent track.

[105] Q. All right, could you tell me just what the members of a six-man crew would do if they were on a double main line track and had an emergency stop. Who would do what? A. The, one of the brakemen on the caboose would protect the adjacent track to the rear.

Q. How does he do that? A. By flagging. He would provide flag protection.

Q. Where? A. On the adjacent main track.

Q. Does he go back behind the train to do this? A. He will go a sufficient distance to provide the protection.

Q. And what will the man on the front of the train do?

A. He is required to protect ahead on the adjacent main track until it is determined that it is not foul.

Q. And how then is it determined whether or not it is foul? A. At times you can tell by just stepping to the ground from the caboose or the engine, if it is on a curve you may have to walk at least part of the train to determine that.

Q. All right, when some crew member has then made that determination that the adjacent track is not fouled, do the two flagmen, are they required to continue performing this flagging service? A. No, sir.

[106] Q. What are they free to do then? A. They are free to return to the train, and if the train can proceed, they proceed. If not, they are free to perform any duties that are performed.

Q. If there is work to be performed on the train to get it in condition where it can proceed, at that point if you have a six-man crew, how many men do you have available to do the work? A. You would have all six.

Q. Is there any conditions that occur to trains that you operate that would require a six-man train crew to correct? A. No, sir.

Q. Mr. Sheppard, was there testimony that trains were frequently stopped at or switched across public crossings and public safety often required posting signalmen at these crossings? A. Yes, sir.

Q. Would that statement still be substantially true in the present day operations? A. Yes, sir, it would.

Q. How many signalmen do you need, how many signalmen do the rules require placing at a public crossing when the operations are going to be conducted where a signalman would be required? [107] A. One.

Q. What rule is that? A. Rule 103.

Q. Is there any need for more than one signalman at a grade crossing? A. No, sir. More than one would be an additional hazard. One can provide all the protection that is necessary.

Q. Was there testimony in that record that in switching it was required that brakemen worked the automatic coupling and connection and disconnection of air hoses? A. Yes, sir.

Q. What is the present situation with regard to those operations? A. The brakemen still work the automatic couplers by lifting the pin lifter from a point on the ground at the side of the car. It is not necessary to go between the cars. They don't have to uncouple air hose. They are required to couple air hose on certain occasions, but they don't ordinarily switch with air. Air hose are coupled after the switching is completed.

Q. How do you get the air hoses uncoupled if they don't uncouple them? A. You turn the angle cocks and let the engine pull the hose apart.

Q. Is that permitted by the current rules? A. Yes, sir.

[108] Q. What is involved in coupling air hoses, Mr. Sheppard? A. Just taking each of the two hoses, one in each hand, raising the end of them and pressing them together and turning them aloose.

Q. How many men does it take to do this job? A. One man. Another man would be in the way.

Q. How long does it take to make this connection between the two air hoses, normally? A. Four or five seconds.

Q. Mr. Sheppard, was there testimony in that record from witnesses who were of the opinion that switching could be done with greater safety to the train crew with three brakemen, and that efficiency of trains and freight movement would be enhanced with less danger of accidents? A. Yes, sir.

Q. I have marked for identification Plaintiffs' Exhibit 99 which is a photographic copy of pages 123 through and including 132 of the brief filed by the Attorney General on behalf of the defendant in the Norwood case in the three-judge District Court. These pages contain the At-

torney General's listing of the proof he adduced in the Norwood trial to justify the crew consist law and I intend to question Mr. Sheppard as to the changes now that have occurred and the conditions therein reflected in the Norwood case.

* * * *

[109] Mr. Youngdahl: We object. We object on substantially the same grounds that we objected to prior documents.

Mr. Lessenberry: We make the same objection.

Judge Van Oosterhout: The same ruling.

Judge Henley: My comment to that objection is that I understood that one of the grounds of your earlier objection was you thought the Court was limited in this instance to a change since the Norwood case?

Mr. Youngdahl: Yes.

Judge Henley: Would that portion of your objection go to this exhibit also? This is the Norwood case, isn't it?

Mr. Youngdahl: That is correct. But just the evidence of what the Court found to be significant in the Norwood case is what the Court said, not what some argument in a particular portion of the argument which was adduced by one of the contending litigants in that case.

Q. Mr. Sheppard, at page 123 of Plaintiff's Exhibit 99 it was stated that during the period reviewed in the Norwood case a large percentage ranging to 70% to 85% of the cars handled on the Missouri Pacific Railroad in Arkansas are cars belonging to other railroads or companies. What would be your observation on that comment in light of present day circumstances? [110] A. That would be true today.

Q. Are there any standards by which your railroad is governed in which cars belonging to others it will accept and handle and which it will not? A. Yes, sir, that is regulated by the AAR and the AAR rules are adopted by the railroads of the country, and they apply to all the railroads.

Q. Just briefly, this is covered by some of the written testimony in detail, but what sort of rules are these, basically? A. They are safety rules mainly.

Q. Do they pertain to the condition the equipment must be maintained in? A. Yes, sir, they do. Not only the condition in which it is maintained, but also the equipment on the, I mean the truck sides, brakes, and the various parts of the cars must meet a certain standard.

Q. Is this related to or a result of the Safe Compliance Act? A. Yes, sir.

Q. Will there be any material difference in view of those uniform requirements in the safety features on a car owned by Missouri Pacific and on a car belonging to somebody else that Missouri Pacific handles? A. No, sir.

Q. It is stated that many Missouri Pacific and other cars handled on the plaintiff railroad in Arkansas are of [111] wooden construction and wooden underframes. What is the present situation in that regard? A. There are no cars with wooden underframes, and haven't been for years. A portion of some of the equipment is of wooden construction. The inner lining of certain cars that are required for handling certain commodities must be wood construction. But the majority of the cars are of metal construction. And the stress points are all metal.

Q. The statement is made that there are wooden car doors and doors fall off. Are there now wooden car doors? A. There are some wooden car doors.

Q. More or less than there were at the time? A. Very few wooden car doors left.

Q. Do sometimes the doors still fall off? A. Occasionally they do fall off.

Q. Does this sometimes result in injury to someone being hit by the door? A. Yes, sir.

Q. How does assigning a six-man crew to a train affect the hazard produced by a door falling off? A. Well, the additional unneeded crew members would just be available to get hurt if they happened to be where the door fell.

Q. The statement is made that there are old style draft gears. Have draft gears changed in any way since those in use when [112] you went to work in 1936? A. Yes, sir.

Q. In what way? A. They are of a stronger metal, the AAR has made extensive research in connection with improving the strength of the draft gear. They are, many cars are equipped with cushion underframes or rubber draft gears, and the springs in the draft gear has been improved to the extent that it reduces the shock of slack action.

Q. There is proof there that there are old style arch bars, many cars not being equipped with the steel one piece truck side. What was the old style arch bar, Mr. Sheppard? A. That was a truck side that was constructed of several pieces of steel held together by bolts and nuts. There are no more arch bar trucks. They have been outlawed.

Q. When you say outlawed—— A The AAR prohibits the use of them in interchange.

Q. I show you a photograph that I have marked Plaintiffs' Exhibit 100 and ask you if that is a picture of a car with the old arch bar?

Judge Van Oosterhout: One of the judges has inquired, Mr. Light, as to what the AAR is.

Q. Would you state what the AAR is? A. That is the Association of American Railroads.

[113] Q. Could you describe just very briefly what, if any, work that organization does in the way of research affecting railroad equipment and rolling stock, mobile stock? A. I can't in detail, but I do know that the majority of the railroads in the country are subscribers to the AAR and contribute sums of money to carry on research for the benefit of all of the American railroads.

Q. Do you happen to know whether the Interstate Commerce Commission from time to time enters orders adopting the standards of the AAR in requiring that all railroads comply with them? A. Yes, sir, they do.

Q. Did you identify Plaintiff's Exhibit 100 as a car with the old style arch bar construction? A. Yes, sir, it is.

Q. What is the advantage of the present construction of the trucks on railroad cars over the now outlawed arch bar construction? A. The truck side on the present day car is one piece of steel and there is no danger of a bolt working loose causing truck side to disintegrate.

Mr. Light: I offer Plaintiff's Exhibit 100, Your Honor.

* * * *

[115] Q. Does Plaintiff's Exhibit 100 fairly portray the type of railroad cars in common use when you went to work for the railroad in 1936? A. As far as the trucks are concerned, it does.

Q. Mr. Sheppard, there is testimony that there are draft beams of wooden construction. How is that condition on present day railroads? A. There are no draft beams of wooden construction. There have not been any for many years.

Q. There is further testimony in the period that Norwood examined that hotboxes are frequent, sometimes averaging one per run. Could you tell me what the average instance of hotboxes are now per run on your railroad in Arkansas? A. Some days there won't be any on the entire district, and some days there will be one and possibly as many as three. They will not average more than one per day in my best estimation, on the entire Southern District.

Q. There was testimony that only about one per cent of the [116] cars then in use are equipped with the new style booster brakes and that modern booster brakes are frequently frozen and difficult to move. What type of hand brake is now employed by cars handled by your railroad? A. The most common is the Ajax which I described this morning, and there, I don't know of any old staff hand brakes at the present time.

Q. Well, is the Ajax a new style booster brake? A. The

Ajax is one of the first booster brakes. Since then they have adopted several others, several different companies have produced the booster style brake, but they all work on the same principle. In fact, they are the same thing.

Q. Is the hand brake in common use on the cars now handled by your railroad frequently frozen and difficult to move? A. No, sir. That is a very infrequent occurrence.

Q. Is it still necessary to use this brake club that you referred to this morning to manipulate the brakes in use? A. No, sir.

Q. Is it still necessary to get under the car to turn the cut out lever, Mr. Sheppard? A. Yes, sir, it is. Possibly on some cars it is located in a position where it is not necessary, but it is still necessary on many cars.

[117] Q. It is still necessary to go between cars to open and close angle cocks? A. Yes, sir.

Q. Likewise, it is still necessary to go between cars to uncouple air hoses? A. No, sir.

Q. Is that because your procedure now permits the locomotive to pull the hoses apart? A. That is correct. After a break type reduction is made and the angle cock is turned, it is permissible to let the engine pull the hose apart.

Q. How many men does it take to do this job of getting under the car to turn the cut out lever or go between the cars to open or close the angle cock? A. Only one man.

Q. What sort of protection, if any, does he have when he performs that operation? A. If it is a member of the train or engine crew he has an understanding with the engineer and the fireman as to the work to be done so they will not move the engine until he is in the clear.

Q. Are there other circumstances that a man would be doing this? A. Mechanical people in the yards use a blue flag or blue [118] light at each end of the cars which prohibits moving the engine or cars.

Q. Is this covered by the published rules of your railroad company? A. Yes, sir.

Q. There was testimony that application of air by means of the valve in the caboose is dangerous and causes serious damage to the train. What is the present circumstance on that? A. Of course, it is not necessary to use that valve with the frequency it was prior to the radio. If the conductor wants the train stopped the best way to do it is contact the engineer on the radio and tell him to stop.

Q. What is the difference in the ability to make a control stop from the valve in the caboose and the one that the engineer operates? A. Well, the valve on the caboose has several positions, but once you move the valve to the number one position it cannot be restored to release until you have made a full service application and stop the train. You can, it can be done but it will damage the mechanism. Of course, if the conductor applies the air from the caboose the engineer may still be working power, and that would make a difference.

[119] Q. When the engineer makes a brake application with the controls that are available to him, does he make any sort of adjustment in the amount of power in the course of making a brake application? A. Yes, sir. It would depend upon the amount of power he was working, the time and grade and so forth.

Q. In 1936 you were on a caboose and some occasion arose that you would want the train to stop, what means did you have of communicatiing with the engineer to get him to stop? A. The only means we had was the hand or light signal.

Q. Are these radios on the caboose and locomotive set up where the crew can communicate between those two points? A. Yes, sir.

Q. There was testimony in Norwood that brake beams dropped causing serious injury and damage. What changes, if any, has there been in the construction of the brake beam to make it a safer device? A. The brake beams referred to in the Norwood case were supported by

a link and a pin arrangement, and the pins would frequently work out, permitting the brake beam to drop, and when it drops it drops right in front of the wheel. The more modern brake construction has a metal bar supporting the brake beams which prohibits it from falling in front of the wheel.

[120] Q. Have you during your years of railroading experience ever known of anyone being injured as a result of the brake beam falling? A. No, sir.

Q. Mr. Sheppard, there was testimony that air brakes were in general use on plaintiffs' freight trains in 1905. Can you tell me the most significant difference, if there is any significant difference, between the type air brake system now employed and that that existed back in 1905 as reflected in the 1907 record that you referred to earlier? A. Well, the first air brake that I had any knowledge of was the old K-triple type, and while I don't know all the details of how it functioned, it was a brake that could give you some very severe slack action. And the present air brakes are AB brakes which give a more uniform braking and permits an emergency stop at any time even after full service application has been made.

Q. Is there any difference in the percentage of cars operated with the braking system operative presently as compared to the early 30's? A. The early 30's 85% of operative brakes was required out of the terminal. At the present time 100% operative brakes are required.

Q. Mr. Sheppard, there was testimony about old style couplers [121] being used. How does the coupler now in use compare to those that were common when you went to work on the railroad? A. In appearance there is very little difference except for the pin which engages the knuckle. Most of the pins in the present day construction have a link underneath the coupler and you don't have the problem you did with the old pin on top of the coupler which in many cases would not fall into place when the

draw-heads were compressed, and it was necessary to go between the cars with a piece of wood or your hand and feel up under the draw-bar, up through a hole in the draw-bar and tickle the pin, as it was called, to make it fall.

Q. What is done with the present day coupler if the pin doesn't fall when it should? A. About all you can do is shake the pin lifter and in most cases it will fall. If it doesn't you, the only other thing I know to do is slack away and couple up again.

Q. Is it necessary to go between the cars and shake the pin lifter? A. No, sir, you can stand outside to do that.

Q. It was stated in the Norwood case that no coupler is truly automatic, the knuckles are closed by impact in switching cars and must be opened by hand. Is it true that couplers must be opened by hand? [122] A. The pin lifter must be pulled by hand but when the pin lifter is pulled and the car is parted the knuckle opens and will remain open unless it is disturbed by impact from the other end of the car or from some other source.

Q. It was alleged that the coupler centering device does not always operate necessitating pushing the coupler into place with hands or feet. This was always necessary on curves and frequently necessary in switching operations. Is the practice of making this adjustment with the feet permitted? A. No, sir, not with the feet.

Q. What is the present situation with regard to the coupler centering device and its operation? A. On occasion it is necessary to adjust the coupler by hand.

Q. How many men does it take to perform that operation? A. One man.

Q. It was stated that short side tracks make saw-bys necessary. Tell the Court what a saw-by is and state what the present circumstance is for saw-bys. A. A saw-by is a condition that exists when two opposing trains are to meet and one of the trains has more cars than the siding

will hold that requires that, if the longer train arrives first they pull in the siding and remain there until the train that will fit the siding arrives and pulls in the clear, and they proceed. While they are [123] waiting for the shorter train the rear of the train is hanging out on the main track.

Q. What has Missouri Pacific done in Arkansas, if anything, since you entered the railroad industry with regard to construction or lengthening of the sidings in this state? A. We have lengthened a number of sidings and we have constructed new sidings completely.

Q. Is there anything inherently dangerous about a saw-by? A. No, sir, if it is in train order territory, and the inferior train has the longer train, it may be necessary that he protect the head to flag the opposing train, if he is going against the schedule and doesn't have a straight train order meet.

Q. It was alleged that there were very few remote control switches. What is the situation on remote control switches now? A. All the CTC territory is equipped with remote control switches with this exception. Between Little Rock and Alexandria, Louisiana, CTC was put in the last two or three years, and it is a modified type which has a remote control switch at one end of each siding and a spring switch at the other.

Q. What is the significance to a train crew with regard to what air job is and whether or not the switch is remote control? [124] A. Remote control switches are operated by a dispatcher or control operator from a central point by levers, push-buttons and electric motor, and it is not necessary for the train crew to get off the equipment to handle the switch.

Q. With regard to the territory from Little Rock to Louisiana where you indicated that one end of the switch, of the siding had a remote control switch and a spring switch on the other. Is it necessary for the crewmen to

get off in leaving that siding through the spring switch? A. No, sir, not when leaving the siding in a trailing movement through the spring switch. It is equipped with a spring mechanism that permits running through the switch and the switch point will return to normal after movement is made.

Q. Could you give us a rough idea of the proportion of the Missouri Pacific railroad's operations, train operations in Arkansas that are conducted over CTC territory as contrast to those that are not? A. CTC territory from Poplar Bluff, Missouri, to Texarkana; CTC from Little Rock to Alexandria, Louisiana; and I believe that is all of the CTC. There are some ABS on some other territory.

Q. What I am really wanting to know is what volume of your train operations in Arkansas go over these CTC tracks? [125] A. Well, of course, the line between Poplar Bluff and Texarkana is our heaviest traffic freight line. And the line from Little Rock to Alexandria is also a heavy line, but not as heavy as the Poplar Bluff to Texarkana.

Q. There is the statement that the hold yard in Little Rock is extremely dangerous and the underfooting there has been little improved. What use is the hold yard at Little Rock now put to? A. We have a rail welding plant in the hold yard at the present time. We shove thirty-six car welded rail trains in there intact and we don't switch them—shove them in and pull them out.

Q. Switching is not conducted in that yard anymore? A. Very little. There is some switching with some of the material.

Q. What is the practice in that yard and the other Missouri Pacific yards with respect to maintaining safe footing within the yards the men are required to work in? A. We have modern track cleaning equipment that operates on the rails, sweeps up the debris, and levels the walkways. The debris is loaded into trucks or freight cars and hauled away and dumped.

Q. How long has that type of equipment been in use by the Missouri Pacific? A. About ten years is the first piece of that equipment— [126] ten years ago is the first piece of it that I recall being in use.

Q. There was proof that there were overhead obstructions present in many yards and they are perilous. Are there overhead obstructions in the yards now? A. Yes, sir.

Q. Are—— A. But we don't permit employees to ride on the roof of moving cars, so there is no hazard if you are not on top of the car.

Q. Is that a written rule of your railroad company? A. Yes, sir.

Q. About when did that go into effect? A. About four or five years ago. I don't remember exactly.

Q. There was testimony that many yard tracks are close together, too close together to clear a man hanging on the side of the car. Does that condition still exist in some of your yards? A. There are some track centers that are too close to clear a man on a car, if there are certain type loads on adjoining tracks.

Q. How is switching handled at those locations? A. They stay on the ground.

Q. It was alleged that curves in yard tracks makes switching [127] difficult and dangerous and requires a third helper to pass signals and guard crossings. Does that condition still exist in any of your yards or switching operations under your jurisdiction in Arkansas? A. We have curves in our yards and our other tracks, but I don't know of any location that would require a third man because of curves.

Q. After the train has passed over a crossing that a man has located himself to protect, is he then free to go join in the work about the train? A. Yes, sir. In fact, there is no reason why he couldn't catch the leading car at the crossing. After he protects the crossing and it is occupied, it is permissible for him to ride the car.

Q. Is it customary? A. Yes, sir, it is.

Q. It was alleged that grades in yards increased the perils and difficulties of switching operations. What is the present situation on that in Arkansas, Mr. Sheppard? A. We have grades in certain yards, and while it is no more hazardous, it could be more time-consuming because you can't kick more than one car at a time up the grade. You either have to shove the cars to a stop or if you are kicking cars, kick a car and get it to stop before you kick another one.

[128] Q. Can you tell me one of the Missouri Pacific yards operated in Arkansas where there are grades of this character? A. The south yard at El Dorado is a good example. Of course, we built the grade into the North Little Rock hump yard for the express purpose of switching cars. But is equipped with electronic retarders, and there is no need for riding cars in that yard to control them by use of the hand brake.

Q. Has there been any greater incidence of employee injuries in your El Dorado yard than other comparable yards in the State? A. No, sir, I am sure there hasn't.

Q. It was alleged that modern train conditions with longer trains and air brakes would produce a new peril to workers on the trains and to the public, peril of slack and resulting shock, it may be due to starting and stopping or to the running in and out of slack of grades. Slack causes many injuries to railroad men. Is slack still a problem in the railroad business? A. Yes, sir, it is a problem, but it is not as great a problem as it used to be. With a diesel locomotive the starting can certainly be controlled more easily than it could with a steam locomotive. And with the new cushion underframes and the rubber draft gears and the new spring mechanisms in the draft gear, much of the slack is eliminated.

[129] Q. What effect does using a crew of six men on a train (strike that)—What is the relationship between

using a crew of six men on a train and the hazard of slack action to train crewmen? A. It just increases the hazard of someone getting hurt by slack action. If you have unneeded crew members on the train they are as likely to get hurt as the one you need on the train.

Q. It was alleged that when a train is made up the rear brakeman takes care of the caboose equipment, the head brakeman puts the engine on the train, couples and makes necessary connections, the third brakeman must check the train, get the switching list and make inspection of the train in and while it leaves terminal. How is the train made up at these major terminals, Mr. Sheppard? A. It is made up by a yard engine, and the caboose is equipped and supplied by caboose supplyman which works in the mechanical department.

Q. As a minor point for the train crew does participate in making up the train, how many men does it take to do this job? A. Four men in most cases.

Q. It was stated that the rear brakeman protects the rear of the train when stopped and makes such inspection as he can, the head brakeman does the same in front, the [130] third brakeman takes care of all switching on the road and is a general utility man. I believe you have already covered in your testimony what the rules now permit in the way of flagmen. A. Yes.

Q. It is stated that it is always necessary to ride the trains when running under slow orders. Does that have reference to a rule that was then in effect, Mr. Sheppard? A. Yes, sir. The rule at that time required that the rear brakeman ride the top of the rear car over a slow order.

Q. What is the car spotting present rule and practice? A. A member of the crew is required to give a signal to the engineer indicating that the train has cleared the slow order, but it is not specified what part of the rear car he be on.

Q. Is he permitted to ride the—is he permitted to ride

the top of the train? A. No, sir, he is prohibited from riding the top.

Q. And how can he communicate that signal to the engineer on your modern equipment? A. On the radio.

Q. It was stated that on curving track or in bad weather it is necessary to have a man at or near the center of the train to pass signals. Is that still a practice on your railroad? [131] A. No, sir, that is not permitted either. That was a requirement that a trainman be on top of the train in the middle of your train.

Q. It was stated that dust increases the difficulties with signaling. Do you agree with that, Mr. Sheppard? A. Yes, sir.

Q. You have had the experience of conducting switching operations and train operations under dust conditions, extreme dust conditions? A. Some of the very most extreme that have ever existed, I suppose, in Colorado.

Q. Would you describe to the Court how you handled that. A. Well, during the so-called dust-bowl days we had dust storms that would reduce the visibility to less than a car length in the middle of the day. I got some walkie-talkie radios and issued walkie-talkies to the crew members. We required that they stop, walk the train and make inspections every few miles because the dust also caused many hotboxes with the old waste packing, and when they found a hotbox or any condition that required setting out a car, they did it by use of the walkie-talkie radio. I don't know how many men it would have taken to tried to pass signals; it just would have been impossible.

Q. What size crews did you use to conduct those switching operations with the walkie-talkie radio? [136] A. Five-man crew.

Q. Did you have any difficulty getting the work done? A. No, sir, the inspections made the trips slow, it took them quite awhile to get over the road on account of the frequent stops making inspections.

Q. Did you have any injuries to employees on those five-man crews switching with radios in the dust storm? A. No, sir.

Q. It is stated that it is seldom possible to see the engine from the caboose to pass signals because of high cars intervening. What is the practice on your railroad with reference to high cars and the caboose? A. It is a practice, while it is not a rule it is a practice to place a low car next to the caboose because the trainmen and conductors have requested it. In fact, in our safety program we have safety cards to solicit safety suggestions from employees, and we have had safety cards on it. As a result we put a low car next to the caboose in most cases. If there is one available, we put it next to the caboose.

Q. Well, under the present conditions, if the men on the caboose can't see the locomotive, how do they signal the engineer? A. With the radio.

[133] Q. It was stated that it is not true that there is only one signal of any consequence necessary to be passed to the engine, as stop and proceed signals must both be given. Do you understand what the point of that assertion is? A. I am not sure that I do.

Q. Tell us briefly what sort of signals are under modern conditions ordinarily passed from the caboose to the locomotive. A. With radio equipment. It is usually not handled by signal, it is handled by conversation and instruction. But the case referred to, it no doubt was necessary to give stop signals and proceed signals by hand.

Q. Mr. Sheppard, there is proof that the brakemen or a brakeman must ride the leading car when pushed in front of the engine. What is your present rule on that? A. If the move is to be made the full length of the track it is necessary that a crew member place himself in a position to protect the move.

Q. Is this likewise true of a crew of a public crossing over which a shove is to be made? A. Yes, sir. That

move must be protected by a crew member on the ground or on the leading end of the leading car.

Q. Has this rule been modified in any way since you came to work in 1936? A. Yes, sir.

Q. In what respect? [134] A. In 1936 the move could be made only on a signal given by an employee on the ground at the crossing. The present day rule permits the employee to be on the leading end of the leading car.

Q. What is the effect of the modification on safety of that man there at the crossing? A. Under the old rule if a crew was shoving a car approaching a crossing, it would be necessary that the move stopped unless there was another crew member on the crossing, the move would be stopped and the brakeman on the leading end would get to the ground and walk to the crossing and give a signal to proceed, and the time it took him to stop and walk to the crossing, the traffic which was not in evidence prior to stopping could appear and cause a hazard. Not only the trainman but the vehicle traffic.

Q. Did this result in this trainman being exposed to the hazard of the crossing in a lesser period of time? A. Yes, sir.

Q. There was also proof that a brakeman must ride in any car carried back of the caboose. Is this the rule now? A. No, sir.

Q. It was alleged that inspection required at least two men to properly inspect either stopped or running train. Can one man inspect a stopped train? [135] A. Yes, sir.

Q. He can do it as fast as two? A. No, it would take him longer, but he can do it just as well as two.

Q. It was alleged that the air pressure at the rear of the train must be checked. Whose job is this under present day practice? A. Where car men are employed, it is the job of the car men, mechanical employees.

Q. To what extent would any member of the train crew have an obligation to do that, and how would he go about doing it? A. In the event the train crew was making the

air test because of the absence of mechanical people, the caboose is equipped with an air gauge, and he merely observes the pressure on the air gauge.

Q. Is there still a rule that employees must inspect all passing trains? A. When practicable, yes.

Q. Is that a provision in the rules? When practicable? A. Yes, sir.

Q. How is that applied? A. If a train turns out to meet a train or let a train pass, clears the main track, the crew members divide on each side of the track and inspect the train as it pulls by. It is also required of the maintenance away employees that are working on the track. [136] Q. Mr. Sheppard, it was apparently proved that employees, train crew, must redope journal boxes, carry spare knuckles, brasses and chains in caboose and rerailing frogs on the engine for repair of break-in-twos, hotboxes and derailments. Do these crews still redope journal boxes? A. No, sir, they don't even have any dope. The cars that are not equipped with roller bearings or sleeve bearings, are equipped with lubricator pads, and they are not required to apply pads.

Q. It is stated that brakemen must fire the engine if the fireman becomes ill or is injured or if the automatic stoker fails. Is anyone required to fire the engine under operating diesel locomotives? A. No, sir.

Q. It was stated that if livestock is down in the cars, brakemen must get it up again. What is the present situation on handling livestock on the railroad today? A. There is very little livestock handled. We have a movement once a year which consists of from 125 to 200 carloads from Texas to Pennsylvania, and outside of that there is an occasional car.

Q. What is the rule with regard to brakemen handling livestock in this connection? A. The rule is still the same. [137] It is covered in a livestock pamphlet. But the brakeman is not required to get in the car or take any positive action to get the animal on its feet. Ordinarily,

they may get some object and punch the animal to see if it is able to get up, and if it is not they make a report of it.

Q. How does the volume of livestock you now handle, which you just described, compare with the volume of livestock handled on the Missouri Pacific when you went to work in 1936? A. Well, there was quite a bit handled then. I don't, I couldn't begin to say how much a year, but there was quite a lot more than there is now. In fact, there was LCL shipments of hogs in this area.

Q. Did the train crew load and unload those? A. They helped.

Q. It was alleged that the train crew must open and close vents of refrigerator cars and it frequently took two men. Is that still the practice, and does it take two men? A. Occasionally it is necessary to manipulate the vents on refrigerator car, but most of the modern refrigerators are mechanical cars which do not require any manipulation. In no case would it take more than one man to handle the vents. The only requirement for men is in case one man has to go in the bunker to tend the heater, it is required that there be another man present in case he is overcome [138] by fumes. But that applies to the refrigerator company employees and not the railroad employees.

Q. It was said that the train crew must eject trespassers, and that this was more difficult to do under modern conditions than it had formerly been. What was the trespass situation when you went to work in 1936? A. There were numerous trespassers. At times it would be ten or twelve, maybe more, on a train. And hardly a train operated without some trespassers.

Q. Is that hoboes we are talking about, this sort of trespassing? A. That is what I was referring to.

Q. How does that compare with present operations? A. Occasionally it is possible to see one or two on a train, but very seldom.

Q. Does the present rule require trainmen on the train crew to eject these trespassers? A. No, sir. The only rule that could be applied to that is the rule that prohibits unauthorized persons from riding trains.

Q. It was alleged that the third brakeman has the hardest job on the train and is usually the youngest man in point of service. What is the present situation on that, Mr. Sheppard? A. Well, where you have a three-brakeman crew, ordinarily the older brakeman insists that the younger brakeman do [139] all of the work. They take the easiest jobs, and actually I don't know just what they are referring to as a third brakeman, because any one of them could be the third brakeman.

* * * *

Q. At page 130 of Plaintiffs' Exhibit 99 it is indicated that as of the time that record was made conductors did not dare to do braking or switching work, for if they did so and were injured, compensation would be denied them. What is the conductor's responsibility with regard to what is referred to as braking and switching work at the present time? A. A conductor is responsible for the safe performance of the crew, and there is nothing to prohibit the conductor from engaging in the actual switching operations.

Q. Is there anything to your knowledge that would affect his compensation for injury if he does that? A. No, sir.

Q. In case of break in two, it is alleged that the rear brakeman [140] protected the rear of the train and the head brakeman the front until their condition was known to be safe, and in such a situation, if necessary, to cut the train at grade crossings. This would have to be done as soon as possible and necessitating more help. How many men would it take to safely perform the operation there described under the present circumstances? A. Four men.

Q. It refers to a situation involving switching across a double crossing, pointing out that two men are needed for this work. Do you know what sort of operation that describes? A. It appears to be describing crossings consisting of more than one track.

Q. How many men would be required to be on the crossing to warn the motoring public in that instance? A. Only one.

Q. It points out that it is necessary to set hand brakes on cars left standing on grades. Is this still the situation? A. Yes, sir.

Q. How many men does it take to set a hand brake? A. One.

Q. It is alleged that to pass signals on a long string of cars being switched on a curving track requires several helpers. How can the number of men required to pass signals in moving a string or cut of cars be reduced? [141] A. When switching a string of cars the number of cars can ordinarily be reduced to the number that can, to the number of cars that could be handled by the number of crew members available.

Q. Do they switch long strings of cars in states other than Arkansas where you supervised operations of the Missouri Pacific Railroad? A. Yes, sir, there is no difference in the operation in Arkansas and in the other states.

Q. What size crews are you doing it with in these other states? A. Some three-men crews and some four-men crews.

Q. It is alleged that at the time of Norwood in switching cars on a grade it is necessary for a brakeman to ride each car. Is that, does that correctly reflect the current practice in railroading? A. It would depend upon the conditions. If switching cars downgrade and cutting the cars off and letting them roll free, it would be necessary unless there were cars in the track with sufficient hand brakes set to stop the cars and hold them in the track.

Q. It was alleged that third helper is needed where

three cars are switched into three different tracks at the same time. Are you famiiar with that operation? [142] A. Yes, sir.

Q. How many men would you need on the ground to perform that operation? A. Two men under ordinary circumstances could perform it on a lead where this sort of operation takes place.

Q. Mr. Sheppard, there is some data on page 131 about the grade crossing situation in Arkansas in about 1928. Can you tell the Court briefly how the interstate highway system is affecting the volume of vehicular traffic over railroad grade crossing in this state? A. Well, the grade is separated on the interstate system. There are no grade crossings to my knowledge.

Q. And generally speaking, what is the nature of the volume of highway traffic on the interstate systems? A. Well, it naturally flows to the best roads available in the interstate system starting with the best available in the state.

Q. Mr. Sheppard, in complying——.

Judge Henley: Let me see if I understand that. Are you saying that the interstate highways are having more traffic and more grade crossings or that the building of interstate highways is reducing traffic on the non-interstate highways?

Mr. Light: Your Honor, I think you could draw both inferences from the testimony.

[143] Q. Has Missouri Pacific Railroad Company in compliance with the award of Arbitration Board 282 served lists of firemen's positions to be abolished? A. Yes, sir.

Mr. Youngdahl: Your Honor, we object to that line of testimony on the grounds that under the Supreme Court decision in this case in the first place it is established that the Arbitration Award 282 does not apply to the State of Arkansas because the existence of the facts that are in issue here that any testimony about the affect of Arbitration Award 282 in Arkansas is testimony of an

abstract and self-serving nature. It has no effect in Arkansas, and for that reason, plus anything else which might be objected to on other grounds including hearsay and reference to incompetent material insofar as the issues before this court is concerned, we object to the entire line as it refers to Arbitration Award 282.

Mr. Lucente: If the Court please, under the provisions of Award 282, the carriers which were parties to the award, including the Missouri Pacific and other plaintiffs in this case, were required within a certain time after the effective date of the award to serve lists upon the local chairman of Brotherhood of Locomotive Firemen and Engines specifying the jobs which they proposes to dispense with firemen under terms of the award. The organizations were then required by the award [144] to serve a counter-list specifying the ten per cent of the jobs which they in effect vetoed, requiring the continued use of firemen on those jobs. Insofar as full crew states are concerned, Judge Holtzoff in a recent opinion recorded from the District Court of the District of Columbia held that the award in complance with the provisions which I have just described would be effective as to full crew states upon the event of the repeal of the statute. In other words, Judge Holtzoff recognized that while the statute is in effect the terms of the award permitting elimination of firemen positions would not, of course, under the Supreme Court decision be effectuated. But Judge Holtzoff also recognized and held that the award, if complied with in this respect, would be operative upon repeal or other abrogation of the full crew law. Now, the questions that are asked of Mr. Sheppard are intended to show that the things which are necessary to make the award effective within the State of Arkansas have been done by the Missouri Pacific Railroad. Other evidence introduced this morning establishes the same fact with respect to the other plaintiffs' carriers. And we suggest that it is relevant to what can be done by the Missouri

Pacific under the terms of the award and under the ruling by Judge Holtzoff if the statute is abrogated.

Judge Miller: In other words, what would happen.

[145] Judge Van Oosterhout: I think we will receive the testimony under reserved ruling.

Q. With what frequency have the lists of positions to be abolished been served by Missouri Pacific Railroad Company on the Brotherhood of Locomotive Firemen and Enginemen? A. I believe every ninety days.

Q. And have these lists designated the firemen's positions in Arkansas that the railroad company proposes to abolish? A. Yes, sir.

Q. What firemen's positions have been so listed? A. Well, I couldn't name all of them that are listed. The superintendents handle that with the local chairmen, and I can't list them all.

Q. Were there any firemen's positions on the Missouri Pacific in Arkansas that were not so listed? A. None that I know of, except on passenger trains.

Q. Mr. Sheppard, I direct your attention to the electronic classification yard operated by Missouri Pacific in North Little Rock, and ask you if you know at what speed the cut of cars is pushed up the hump before going over it and into the classification yard? A. From one and three-quarters to two miles per hour.

Q. And where is the inspection pit located in which employees position themselves to inspect the cars moving up the hump? A. The inspection pit is on each side of the incline, on each [146] side of the track on the incline just in advance of the crest tower.

Q. At that rate of speed how long would it take an average length railroad car to move past the inspection pit? A. About eighteen seconds for a fifty-five foot car which we consider average.

Q. Would that then represent the period of time available to an inspector to inspect a single car? A. Yes, sir, that is correct.

Q. What other inspections are conducted of the cars moving through that yard in addition to the one done by employees in the pit? A. On trains that are yarded in the yard to be humped there is an inbound inspection by the mechanical forces which is done by walking each side of the train, they lift the lid on the journal boxes that are not equipped with roller bearings, if sufficient oil in the box the lid is closed, if not it remains open. They inspect at the same time for safety appliance defects, or for any other defects that may be visible.

Q. Do they have the information produced from the hotbox detector at Mablevale at the time they are conducting these inspections? A. Yes, sir, that is correct. There is also another inspection [147] when the cars go over the hump the automatic oiler oils the journal boxes that the lids are left open on, and then when the cars are pulled out of the bowl and shoved into the departure yard another set of mechanical inspectors close the doors, close the lids on the journal boxes, make an air test, and another inspection.

Q. Mr. Sheppard, in your position with the Missouri Pacific Railroad Company in Arkansas to what extent have you had an opportunity to familiarize yourself with the general nature of the operation of the other plaintiff railroads in this litigation in Arkansas? A. In a general way I am fairly familiar with their operations. We interchange traffic with the other railroads, and we interchange ideas. We meet at various intervals to discuss our mutual problems, and in that way we stay fairly abreast of the others operation.

Q. Do you have places in Arkansas operate over each other's track? A. Certain places we do.

Q. Do you have an opportunity to observe the switching operations and train operations of those railroads conducted in Arkansas during your traveling over your line of roads? A. Yes, sir.

Q. Are you in a position to state to what extent the other plaintiff railroads in Arkansas have adopted the improvements [148] that you indicated of the Missouri Pacific Railroad Company has adopted since the circumstances shown in the Norwood record? A. As far as the equipment is concerned it is practically the same, because we handle the same equipment. The dieselization is, I believe, complete on the other railroads, so it is just about the same on all the railroads.

Q. Are the signal equipment and practices used by the other railroads essentially the same that has now been adopted by the Missouri Pacific? A. The function is essentially the same. I don't know to just what extent they have installed CTC or ABS signals.

Q. Mr. Sheppard, have you caused a computation to be made recently of a segment of your railroads in Arkansas to determine what the average time on duty for the road freight crewman is? A. Yes, sir, from the period February 3 through March 4, between Little Rock and Texarkana.

Q. What are the characteristics of this particular subdivision between Little Rock and Texarkana that prompted you to select it for this sampling? A. This is an average or heavier than average traffic subdivision. It is 147 miles in length, which is a fair example. And it is our primary main track equipped with CTC.

[149] Q. Was this sampling made under your supervision and compiled from regularly kept business records of the Missouri Pacific Railroad Company? A. Yes, sir, it was taken from the conductors' time slip.

Q. Would you state to the Court from the instrument I have marked Plaintiffs' Exhibit 101 for identification what the average time was for the local freight trains on that run? Average time on duty? A. Twelve hours and twenty minutes for the local between Texarkana and Little Rock, and thirteen hours and twenty-four minutes

total time on duty between Little Rock and Texarkana.

Q. Is that the train that has been referred to as the Long Barrell Local? A. Yes, sir.

Q. What is the average on-duty time of the through freight trains between those points for this period? A. Five hours and thirty-five minutes per train for a total of two hundred and one trains.

Q. Mr. Sheppard, is this figure you are giving the running time of these trains or total time the crew is on duty, the time they come to work and leave the train? A. Four hours and twenty-six minutes is the total time from the time departed from the initial terminal until stopped at the final terminal.

[150] Mr. Light: Your Honor, I offer—— A. The total time on duty which includes the standing time at the initial terminal, and at the final terminal, if any, is five hours and thirty-six minutes.

Mr. Light: I offer Plaintiffs' Exhibit 101 in evidence.

* * * *

Q. Mr. Sheppard, have you ever had experience in operating and supervising the operation of a train with smaller crews than the six men required by Arkansas law? A. Yes, sir. In every state other than Arkansas.

Q. When you worked in these other states that you related this morning, what size crews were employed there for local and through freight service? A. Some of the main line locals had a six-man crew. The through freights had a five-man crew.

Q. Were the conditions under which those train operations were conducted, equipment used and the type of work done generally comparable to that conducted in Arkansas by your railroad company? [151] A. Yes, sir.

Q. During the years that you supervised and participated in train operations in these other states with these smaller crews were you ever aware of an accident or injury occurring under circumstances that could be at-

tributed to the absence of an additional man on the crew? A. No, sir.

Q. Have you had any occasion to operate crews of less than six men within Arkansas during strike? A. Yes, sir, we have on a number of occasions when an industry would be on a strike and it would be necessary for an officer crew to switch the plant, we operated with less than a six-man crew.

Q. When an industry that your railroad provides railroad service to goes on strike why is it necessary to switch that industry with an officer crew? A. If the striking employees put up a picket line we do not require our employees to cross the picket line.

Q. What officers, what category of railroad officers in the company would you use to operate the train under these circumstances? A. We would always get a competent engine man to operate the engine, and the remainder of the crew ordinarily would be trainmasters or special agents, traffic representatives [152] or any accepted employee.

Q. Do you recall a strike at the Perla Brick Company at Malvern when you were working in that territory? A. Yes, sir, we had a strike there that lasted three years or more.

Q. What was your position at that time? A. I was assistant trainmaster at El Dorado when it started.

Q. Was this brick company within your territorial jurisdiction at that time? A. It was on the Arkansas Division and I was Assistant Trainmaster on the Arkansas Division but not specifically assigned to that subdivision.

Q. Do you know during that three years or more of that strike what size train crew was employed by Missouri Pacific to switch that plant? A. I helped switch the plant several times with a four-man crew.

Q. What type of motive power did you have at that time? A. We had steam power.

Q. Did you have any injuries to employees during that time with the smaller crew? A. Not during the time I was on the division and engaged in switching the plant.

Q. Have any accidents of any sort to your knowledge in this operation? [153] A. No, sir.

Q. Did you have near accidents? A. Well, we got some pretty close bullets one time.

Q. Did you have any connection——

Judge Van Oosterhout: Bullets?

Q. Did you get shot at? A. Apparently we were being shot at because we could hear the bullets as they went by fairly close.

Q. Did you have some connection with providing railroad service at the St. Louis terminal in 1962 during a strike? A. Yes, sir.

Q. 1952. A. Yes, sir, during 1952 there was a strike of eight or nine days duration during the wintertime. It was, the day it started it was seventeen below zero, and about ten or twelve inches of snow on the ground. We switched the terminal with officers and supervisors.

Q. What participation did you personally have in that? A. I was the engine foreman or conductor of the switch crew at Ivory Yard.

Q. What size crews were used during that strike? A. On my crew there were three men part of the time and four part of the time.

Q. Were there any accidents or injuries to employees or members of the public during that nine day period of operation [154] with those crews in St. Louis? A. Not on the crew that I was on, and I have no knowledge of any other accidents.

Q. Do you recall a recent strike at the Westinghouse plant at Little Rock, Mr. Sheppard? A. Yes, sir, there was a strike there last fall that lasted about three weeks.

Q. Did you provide switching service to that plant

with crews of less than six men during that period? A. Yes, sir, we did.

Q. These were also officers? A. Yes, sir.

Q. Do you recall a strike on the Missouri Pacific in late March and April of last year? A. Yes, sir, I do.

Q. How did you operate the railroad in Arkansas during that strike? A. We operated with officers and supervisors.

Q. I will hand you an instrument I have marked Exhibit 102 for identification and ask you if you can identify that instrument. A. Yes, sir, this is a list of the switch engines and trains operated by officer crews during the strike.

Q. Over what period, Mr. Sheppard? [155] A. March 31 to April 3.

Q. Was this the duration of the strike? A. I believe that is correct.

Q. Was that list prepared at your direction and under your supervision from the records of the railroad company? A. Yes, sir.

Q. Does it identify the nature of the regular assignments of the various officers who assisted in the operations of those trains? A. Yes, sir, it does.

Q. Would you select at random two or three of the trains and state the number of men in the crew and what their regular assignment was? A. Well, some of the crews on the first day or two days of the strike consisted of six men. And they,——

Q. Would you like to candidly tell the Court why, Mr. Sheppard? A. Yes, sir, we overlooked the fact that the full crew law would not apply in case of strike. We were trying to comply with the law and we used six men where four men would have been sufficient. And after we found out it wasn't necessary we reduced the crews to four men. And they include roadmaster, traffic representatives, instrument men, roadmasters, two traffic representatives, a trainmaster, master mechanic, general

traffic agent, superintendent of communications, assistant superintendent of safety and rules, and on down the line. It is just a mixture of all employees that are [156] not covered by labor agreements.

Q. Did you have any injuries to employees in Arkansas during the duration of that strike on trains being operated by those crews? A. I don't recall any of sufficient severity to require report.

Mr. Light: I offer Plaintiffs' Exhibit 102.

* * * *

Q. Mr. Sheppard, you mentioned this morning in connection with the time you were stationed at Nevada, the practice of putting a man on and taking him off at Crain. Are there other places at or near the state line that Missouri Pacific Railroad Company either loads or unloads additional men in order to comply with the Arkansas statute? A. Between Van Buren and Greenwood Junction.

Q. That is a distance of how many miles? A. About six miles.

Q. And where do the trains from Van Buren that go through Greenwood Junction run to, where is the next division point? A. To Coffeyville.

Q. These are sometimes through trains from Van Buren to Coffeyville? A. Yes, sir.

[157] Q. How many men leave on the train at Van Buren going to Coffeyville? A. Six.

Q. What happens at Greenwood Junction? A. One of the brakemen gets off at Greenwood Junction.

Q. After having ridden for six miles? A. Yes, sir.

Q. When the trains are coming south at Greenwood Junction what happens? A. They pick up the law brakeman at Greenwood Junction.

Q. Is there some other point near the Arkansas state line where employees go off duty before they have completed the full regular run? A. Yes, sir, at Jones, Ar-

kansas, or Jones, Louisiana, which is between McGehee and Monroe, Louisiana.

Q. How is that handled on the run from McGehee to Monroe, and also on the run from Monroe back to McGehee? A. The brakeman goes off duty at Jones, but he rides to Monroe. He is paid 100 miles per trip. He rides from Monroe back to McGehee, going on duty at Jones.

Q. Mr. Sheppard, have you made any observations of what the members of these six-men crews in Arkansas do with their time while they are on duty? A. Yes, sir, I have.

Q. What sort of observations have you made recently along this line? [158] A. Well, recently we had several cases of men sleeping on duty, readings newspapers on duty.

Q. Mr. Sheppard, I will hand you five instruments here and ask you to tell the Court what those are. A. The first one is a discipline notice, assessing thirty days deferred suspension.

Q. I would like for you to describe as a group what these instruments are, first, Mr. Sheppard? A. Well, they are discipline notices where the superintendent has assessed discipline for employees sleeping or reading newspapers on duty.

Q. And in how many instances were you the officer of the railroad company that personally caught these offenders? A. In three of them.

Q. In the other two were you the officer of the railroad company with final authority that reviewed the case? A. Not final authority. I did review the case after the superintendent assessed the discipline and approved the discipline assessed.

Q. Would you describe for the Court the three instances that you personally observed? A. Well, one of them was a switchman asleep on a hump engine at North Little Rock at 10:15 a. m. I boarded the engine and

shook him and got him awake and talked to him, and explained to him the hazards of sleeping on duty.

[159] Q. What was that date? A. That was July 11, 1963. E. E. Ellis, the switchman, on May 26, 1965, North Little Rock, reading a newspaper while riding the switch engine at about 10:15 a. m. on May 20. The discipline was assessed on May 26. The offense was committed on May 20. The next one is the engineer, G. W. Snodgrass, thirty days deferred suspension for violation of general rule Q of the Uniform Code of Operating rules. He was riding on the fireman's seat of the engine, reading a newspaper while on duty, as engineer, at about 3:00 p. m. August 27, 1965. There is a letter from Mr. Snodgrass attached to the discipline acknowledging his responsibility in connection with this offense. Switchman R. V. Odum, thirty days deferred suspension, violation of the Uniform Code of Operating Rules 34-A in connection with being in reclining position and failing to keep a lookout while riding a hump engine on duty January 26, 1966. And G. E. Billingsley, conductor, dismissed from service, account violation of Rule G of the Uniform Code of Operating Rules while on duty as a conductor of Train Number 748 on Little Rock Subdivision, at about 3:05 p. m. January 16, 1966, in the immediate vicinity of Alexander, Arkansas.

Q. What does Rule G deal with? A. Rule G is the use of intoxicants or the possession of intoxicants while on duty. I was not personally involved [160] in this except to review the transcript of the investigation, which developed that the conductor was asleep on the caboose and when he was awaken it further developed that he was in violation of Rule G.

Q. Mr. Sheppard, are those five instances (Strike that) —Is the earliest of those instances dated May 28, 1963, and the balance subsequent to that date? A. That is correct. That is when the rule was violated, but the discipline notice was dated July 11.

Q. Are these the only instances you know of in your

railroad career of offenses of this character, reading newspapers on duty, drinking on duty, or sleeping on these trains? A. No, sir, they are not.

Q. Why did you select this particular group of five to relate here today? A. Because these happen to be ones that I was fairly familiar with.

Q. Have you noticed any change in the incidence of this sort of misconduct during the various times you have been in railroad service? A. Yes, sir, there has always been occasions for crew members to take a nap occasionally, but it seems to be more prevalent in recent years.

Q. Mr. Sheppard, there is much testimony introduced by the [161] Intervenors in this case which pertains to the questions of whether the brakemen can be trained to perform the tasks that are presently and have been in the past performed on locomotives by a fireman. In your judgment can the brakemen employed under your supervision be trained to perform those tasks? A. Yes, sir, there is no reason why they couldn't, because we hire firemen and after very few student trips put them on the engine on the payroll.

Q. Is there any qualification that performing the task done by a fireman on a locomotive requires that the brakemen are not required to have in order to be employed by your railroad? A. No, sir.

Q. Mr. Sheppard, is the railroad industry a competitive industry? A. Yes, sir, it is highly competitive with other railroads and with other forms of transportation.

Q. Does making expenditures for capital improvement have any relationship to the competitive position of a railroad company? A. It certainly does. You must keep up with improvements or you can't make schedules, and schedules are a very important factor in service.

Q. Would you explain a little more about the importance of [162] making schedules in the railroad business. A. Well, the shippers keep very extensive records on movements of their cars and commodities. In most cases the

carrier that provides the best and fastest service hauls their freight. And that requires fast schedules, non-stop trains, shorter trains. Many things have to be done in order to meet the present day competition.

Q. Is it of any real importance to you in the operation of the railroad to make a connection with a particular train of another line at the end of your line? A. Very definitely. In fact, it is necessary at the present time to pre-block traffic for other railroads at the big terminals in order to expedite the movement through the terminals.

Q. Explain just a little bit how an impairment of your ability to make capital expenditures will affect you in making these schedules. A. We have a very extensive program of relaying heavier welded steel, flying new ties and ballasts, improved signaling, extension of sidings, new sidings, additional double tracks, and all of these require a vast amount of money, and are necessary to have the facilities to make the schedules that are required today.

Q. Mr. Sheppard, are you aware of any other industry with which you compete, transportation business, that is regulated by [163] any agency of the State of Arkansas or legislation of the State of Arkansas that places similar requirements on it with regard to the number of crew members it is required to use in the conduct of its business?

Mr. Youngdahl: We object, Your Honor.

Judge Van Oosterhout: Ruling reserved. Go ahead.

Q. Do you know of any? A. I don't know of any.

Mr. Light: I will ask at this point for the Court to take judicial notice that there is not such legislation in Arkansas affecting any other industry in the transportation business.

Judge Van Oosterhout: You are referring to truckers and the like?

Mr. Light: Truckers, airplane, barge lines, buses and the like.

Judge Van Oosterhout: Judge Henley has a good sug-

gestion. We probably have to take judicial notice, but that if you think it pertinent, ultimately in your brief you will direct the Court to the statutes that you think are important.

Judge Miller: It is like a statute.

Judge Van Oosterhout: Yes, like a statute.

Mr. Light: That is the point, Your Honor, there will be no statutes to direct to the Court's attention.

[164] Judge Henley: Well, I am sure Judge Van Oosterhout and Judge Miller know what the facts are in connection with barge shipments, for example. I don't happen to know, whether any barge crews require it or not. I am perfectly willing to take judicial notice of it after you gentlemen tell me what the situation is.

Mr. Light: I will attempt to decide some way to approach the problem to prove the negative, Your Honor, in my brief in connection with my request that the Court take judicial notice.

Judge Van Oosterhout: They will develop on the other side of the horn if it becomes relative issue if there are, your opponents will probably call them to our attention.

Q. Mr. Sheppard, in connection with your description of the importance of making a schedule to a railroad company and its competitive endeavor, is the stop or slowing down of a train, take these men and let them off near the Arkansas state line, really a significant thing from the viewpoint of the railroad company as it affects the time it takes to move a train? A. Yes, sir, it is. Anything that slows or stops a train is an important factor in making a schedule.

Judge Van Oosterhout: About how much delay would you think, Mr. Sheppard, in making a stop, if it were a stop, for picking up a brakeman, say?

[165] A. It would depend upon the length of the train, but from a slow-down to an acceleration, I would say a minimum of about ten minutes. It could be more.

Q. If you had situations where a through freight train

was operating at its maximum authorized speed and was required to reduce its speed sufficiently to permit a brakeman to depart the train, how long would it take it to get it back up to maximum speed? A. That would depend upon the tonnage, the number of diesel units. It would vary. If you really had more power than you needed to handle the train it wouldn't take him long. If you had that much power you would have too much.

Q. Mr. Sheppard, as a managing official of the railroad company, do you have any economic interest in maintaining the safety of your train operations, switching operations? A. Yes, sir, very definitely so.

Q. What economic incentive do you have in this regard? A. The monetary loss due to accident or injury is terrific. We want enough employees on our train to operate them safely. To do otherwise would not be at all feasible.

Q. What type of economic cost does the railroad company incur in the operations, in what type of situations do you incur such cost? A. It could result in a major derailment. It would depend upon the nature.

[166] Q. How much monetary loss is involved in a major derailment, roughly? A. It could be a million dollars or more.

Q. A major derailment? A. It could amount to a million dollars or more. Of course, many derailments result in loss of two hundred fifty to five hundred thousand dollars.

Q. Do you recall the derailment at Norphlett, Arkansas, three or four years ago? A. Yes, sir.

Q. Briefly, what occurred there? A. An oil truck occupied the crossing immediately ahead of the northbound through freight train. The train hit the tank and trailer, resulting in a fire and derailment to the engines and several cars in the train.

Q. What size crew was operating that train? A. This was a six-man crew.

Q. Do you remember how many of them were on the

front end of the train, in the locomotive? A. I recall that there were three, if I am not badly mistaken.

Q. Is there any way that that collision could have been averted by having additional crew members? A. No, sir. Discussing the matter with the crew members, they were very emphatic in their belief that they could [167] not have done anything and no one else could have done anything on the train to have avoided the accident.

Q. If adding crew members to avert or minimize the hazard of that sort of incident, would you as general manager of the railroad company hesitate to add crew members? A. No, sir. If you could save major derailments by additional crew members, certainly we would want to have them on there.

Q. Do you happen to know whether it is unusually costly to a railroad company to compensate its employees who are injured on duty? A. Yes, sir, it is very costly.

Q. Does the Missouri Pacific Railroad Company have any sort of safety program or activities regularly pursued in that area? A. Yes, sir, we have a safety department. And the safety department makes trips over the entire railroad with an educational safety film that shows them at various locations, requests that the employees attend, and in addition to that the divisional officers have safety meetings and do everything they can to promote safety among employees. I think I mentioned this morning the safety card, solicitation card, available to the employees, any item of safety whether it is an unsafe condition or unsafe practice coming to their attention, we request that they report it to the proper officers so corrections can be made.

[168] Q. Is there a general safety rule contained in the Uniform Code of Operating Rules? A. Yes, sir.

Q. This is a set of rules that is adopted by the management in the operation of your railroad company? A. That is right.

Q. What number is that rule? A. You are no doubt referring to Rule 108, in case of doubt or uncertainty, the safe course must be taken. I had in mind safety is of first importance in the discharge of duty.

Q. Is that a numbered rule also? A. We have that in our timetables, we have it on various publications, and try to keep that before the employees all the time.

Q. Is there any difference in the type on which one of those rules is produced in the book and the balance of the rules in the book? A. Rule 108 is in bold face type.

Q. Is it the only rule in the book that is? A. I believe it is.

Q. Mr. Sheppard, in your opinion is any switching operation conducted by the Missouri Pacific in Arkansas under your jurisdiction that you need six men to safely perform the operation? [169] A. No, sir.

Q. Is there any switching operation conducted in Arkansas by Missouri Pacific that you cannot safety cause to be operated by four men? A. There is none that I know of.

Q. Is there any train runs, freight trains, either in local or through freight service in Arkansas by the Missouri Pacific that you need six men to safely operate? A. No, sir.

Q. Is there any train run by Missouri Pacific in Arkansas that you could not safely, any freight train that you could not safely operate with four men? A. No, sir.

Q. What is the effect on safety of members of the train or switching crew by requiring the use of the six men? A. That merely puts additional men on the crew, which creates an additional hazard of getting someone hurt by virtue of having more men than you need. And with more men than you need to do a particular job, quite often it is, practice that they divide the work, and as a result no one does the job properly. It is left undone.

Q. Mr. Sheppard, have you recently undertaken to illus-

trate your testimony that you do not need six men to conduct railroad operations in Arkansas by having moving pictures [170] made of railroad operations in this state? A. Yes, sir.

Q. Where did you cause those pictures to be made? A. At Kensett, Arkansas, and McGehee, Arkansas.

Q. With respect to the pictures made at Kensett, Arkansas, were you personally present when they were made? A. Yes, sir.

Q. What did you undertake to show in those movies at Kensett, Arkansas? What were they to illustrate? A. To illustrate the six-man Missouri Pacific local crew performing switching at Kensett, and the three-man D K & S railroad crew performing switching on the same track over the same crossing.

Q. What is the D K & S? A. That is the Doniphan, Kensett and Searcy Railroad.

Q. Have you some relationship to that railroad company? A. Yes, sir, I am vice president and general manager.

Q. Is it a subsidiary of the Missouri Pacific? A. Yes, sir.

Q. What sort of motive power do they use on that railroad? A. They use a Missouri Pacific switch engine which is leased to them.

Q. What size crew do they use? A. Three-man crew.

[171] Judge Van Oosterhout: This is a railroad under 50 or 100 miles?

A. Yes, sir.

Judge Miller: I can tell you all about that.

Q. Would you state briefly the characteristics of the D K & S. It runs from where to where? How long is it? A. It is in the shape of a half circle. It runs from Searcy to Kensett to Doniphan. Searcy is a city with many crossings and a number of industries.

Q. How long has that railroad operated with a three-man crew? A. Ever since I have had any knowledge.

Q. Why did you pick this particular siding at Kensett to state this point? A. That is the only point that I knew of that we had six-man crew and a three-man crew performing switching over the same crossing.

Q. Who accompanied you to make these moving pictures? A. Joe Bergetti.

Q. Did you tell Mr. Bergetti when to take pictures and what to take pictures of? A. Yes.

Q. Would you just very, very briefly describe what these pictures will show? A. They will show the Missouri Pacific crew setting out a cut of about eight cars on an auxiliary track at Kensett. [172] They make one switch in the operations. And there will be four men within a few feet of each other, very obviously without anything for two of them to do. And the D K & S crew arriving at Kensett with eighteen cars, a three-man crew performing a number of switch moves over the crossing, and very rapidly and efficiently and safely.

Q. Do these movies at Kensett fairly portray what you observed to happen when you were personally present there at Kensett when they were taken? A. Yes, sir, they do.

Q. Did you cause the movies to be taken at some other point on the Missouri Pacific? A. At McGehee, Arkansas.

Q. What were you undertaking to illustrate with those movies? A. That the six-man switch crew was overstaffed and that part of the time two and three of the men on the crew sat on a bench in front of a switch engine while the remainder of the crew performed the switching.

Q. What assignment was this that you gave your attention to in McGehee? A. This was 7:00 a. m. to 3:00 p. m. yard engine.

Q. What sort of work is assigned to that particular crew? A. Yard switching only. We are in the switching limits of McGehee.

[173] Q. What did you direct Mr. Bergetti to do at Mc-

Gehee? A. He went with me one day. He was directed to get a film of the crew performing this switching, and try to get as many of the crew members in the film as he could to see just what they were doing, and he went back another day—I wasn't present—and he kept a log of an eight-hour period 7:00 a. m. to 3:00 p. m., approximately that, and took pictures at various intervals during that period.

Q. Are these pictures that were made both at Kensett and McGehee under circumstances where you and Mr. Bergetti took not to be observed by the train crew? A. That is correct. However, at Kensett we were in an automobile and I am sure that the crew did observe us. They probably didn't know who we were or what we were doing.

Q. Where did Mr. Bergetti position himself to take the last pictures during this eight-hour period at McGehee? A. He had a camper.

Q. This was a motor vehicle with a cabin apparatus on the back of it? A. I didn't see the vehicle, but I understand that is what he used.

Q. Have you seen these movies taken at McGehee? A. Yes, sir, I have.

Q. Why did you select McGehee to send Mr. Bergetti to take these particular pictures? [174] A. Because I had noticed on other occasions when I went through McGehee on inspection trips some of the crew members sitting on the bench while other crew members were performing the switching at McGehee.

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[176] **March 21, 1967.**

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Mr. Youngdahl: As to Exhibit 100, we have no objection. As to Exhibit 101 we have no objection. As to Plaintiffs' Exhibit 102 which concerns the operation of switch engines during a strike, we object on the grounds

that is irrelevant and immaterial and incompetent in that it concerns periods and circumstances which the proof does not relate to the issues involved here, particularly the factual operations during that period. And we object to Exhibit 102.

Judge Van Oosterhout: Do you wish to add anything, Mr. Lessenberry?

[177] Mr. Lessenberry: In regard to Plaintiffs' Exhibit 100, we object to it inasmuch as it does not portray the arch or the trucks in such detail as the witness related the construction of these trucks. For that reason we urge that they are inadmissible. We have no objection as to Plaintiffs' Exhibit 101. We join the objection of the Intervenor as to Plaintiffs' Exhibit 102, and further object that the exhibit is misleading inasmuch as the occupation shown by the purported crews that served during this time does not reflect the true experience and occupation of these so-called emergency crewmen. That is all.

Judge Van Oosterhout: The exhibits will be received subject to the objections. The ruling will be reserved as to the objections.

* * * *

Q. Mr. Sheppard, directing your attention to the movies that were taken at Kensett the two days which you testified yesterday, can you identify the two documents that I now hand you. A. One of them is the time slip of the engineer and fireman for Train No. 740 of March 7, 1967. The other is the time slip and delay report of the conductor which includes the brakeman on Train No. 740, March 7, 1967.

[178] Mr. Light: I mark these instruments collectively Plaintiffs' Exhibits 103.

Q. Is that a delay report for the engineman and fireman on the Missouri Pacific train that appears in the moving pictures taken at Kensett? A. Yes, sir.

Q. What size crew was assigned to that train? A. A six-man crew.

Q. Between what points was that run conducted? A. Between North Little Rock and Newport, Arkansas.

Q. And what type of train was that? A. That was the local freight train.

Mr. Light: Your Honor, I offer Plaintiffs' Exhibit 103 in evidence.

* * * *

Q. Were you present when all of the moving pictures were taken at Newport when the film was exposed? A. At Kensett?

Q. Kensett. [179] A. Yes, sir.

Q. In whose company were you? A. Joe Bergetti.

Q. Can you by using the plat on the easel show the Court what railroad operations are conducted in relation to, track structure, public street there at Kensett? A. Yes, sir.

Q. Would you come down to the easel, and refer to what I have marked Plaintiffs' Exhibit 104. Would you identify what Plaintiffs' Exhibit 104 is? A. That is a map of the station and the yard track at Kensett, Arkansas, both the D K & S and the Missouri Pacific.

Q. Is that a scale drawing prepared under your direction? A. Yes, sir.

Q. Would you show what the Missouri Pacific train did that is reflected in the movie?

Mr. Lessenberry: I object. I think the movie is the best evidence as to what the train, but we want to make an objection to the movie also. We think at this time for this witness to tell us what the film actually portrays is certainly not the best evidence and not admissible.

Judge Van Oosterhout: The ruling will be reserved.

Q. Mr. Sheppard, will it be helpful to the Court in understanding what railroad activities are portrayed in these movies to have a description with reference to Plaintiffs' [180] Exhibit 104?

Mr. Lessenberry: We will concede this is his conclusion,

but we object to any reference to what he thinks will be helpful to the Court. It is his evidence.

Judge Van Oosterhout: What is the purpose of this, Mr. Light, just to give the general background of the scene where the movies are taken or something of that sort?

Mr. Light: Your Honor, the movies are something of a worm's eye view. The railroad equipment, of course, is quite large, and telescopic lens were used, and for the Court to understand the type of railroad movements being conducted, I think this explanation will be helpful.

Judge Van Oosterhout: The witness was there, as I remembered he testified yesterday. The ruling will be reserved. You may answer, Mr. Sheppard.

A. The first exposure of the Missouri Pacific local train approaching from the south to a point near the depot on the main track, where a stop is made and cut off eight cars, proceeds to the north switch leading into the yard at Kensett. They kicked one Cabot car in one of the yard tracks, a car they had taken by Cabot, and they shoved the remaining cars on this track against the D K & S engine which was standing in that track waiting for this delivery. Then they cut the engine off, backed down the main track [181] couple onto their train, and leave Kensett.

Q. In which direction? A. North.

Q. Which direction is that on this map? A. This direction (indicating).

Q. What did the D K & S crew then do? A. The D K & S crew with their engine right here, the caboose ahead of their engine, drug the cars that the Missouri Pacific crew had delivered to Searcy, shoving the caboose ahead of it.

Q. Will you resume your seat please.—Mr. Sheppard, during the showing of the movie will you describe to the Court what crew members are doing as they appear in the film.

• • • •

Mr. Youngdahl: Mr. Light has afforded us the opportunity to see the movie. We do object to it being shown and the introduction into evidence in Court. We all have had experience [182] with movies as evidence. I think the characteristic of them is that they show isolated things, isolated terms of time, isolated in terms of space. Any time unless you have a movie that shows entire scenes that are relevant to the case for an entire period of time that is relevant to the case, it is deceptive to turn a camera on and off and point it in the direction which is designed to favor the position of the parties presenting the movie. We think it is incompetent, irrelevant and immaterial, and in no sense in terms of this materiality I call the Court's attention to the issue in the case which is not whether or not there is any occasion which a six-man crew is not needed, but is whether or not there is any occasion in which a six-man crew is needed. And a selection of a few minutes at a particular crossing chosen for the reasons pointed out by the witness yesterday, and I re-urge or urge the Court to think about those reasons in this connection. He said that the crossing at Kensett was selected because it is in an area used by both a line covered and a line not covered by the full-crew laws, and one very precise point was dealt with finally in the Supreme Court in the second case dealing with the Arkansas full-crew laws, St. Louis-Iron Mountain Railroad. The exact point. The selection there is for a reason that is immaterial in terms of the issues before the Court. As to the selection of [183] the McGehee, Arkansas, I might go ahead and make a point on that at this time. This is also immaterial because Mr. Sheppard testified that it was selected because he had seen men sitting on a bench at that location. That highlights, in my view perfectly the infirmity of the movie, that a movie is not a panoramic view of things that are relevant to the case, but rather something that is carefully selected. The camera started and stopped and

pointed in the direction, and even the location is selected, in a way which would favor the case presented by the plaintiffs rather than in a way that would assist the Court in determining what the entire picture is. For those grounds of relevancy, materiality, I suppose, competency, we object to the movie being shown at all, and certainly being introduced in evidence.

Judge Van Oosterhout: Mr. Lessenberry, do you have anything to add?

Mr. Lessenberry: I think Mr. Youngdahl has said everything that I have indicated here except that I would make the objection for the sort of analogy. It is more or less in the circumstance of admitting a part of a confession but not the entire confession. I would say that any confession here, that the entire day this particular crew should have been photographed and submitted to the Court rather than just these circumstances that Mr. Youngdahl has stated. That is my view.

* * * *

[184] Judge Van Oosterhout: The Court realizes that it is only isolated instances. There are many other factors, and I don't believe that any prejudice will be created by seeing the picture, and we will be better able to pass on the validity after seeing it. The Court will give full consideration to the objections that have been made. We will proceed to receive the picture and see it subject to the objections. And let me clear this up. We have a photographer here, and that foundation evidence, is there any part of the objections that goes to that, that is, as to the identification as to how it is made.

Mr. Youngdahl: Not from us as far as the physical facts of how it was made.

Judge Van Oosterhout: As to where the camera was placed. We assume they will be available from cross-examination. Will he be available?

Mr. Light: Yes, sir. He will testify in regard to the other movie.

Judge Van Oosterhout: Go ahead with the movie.

Mr. Light: Before the lights are turned out——

Q. Mr. Sheppard, would you show from 104 the point from where the photographs were made. A. In the first movie it was made from this point right here (indicating where a star is) from an automobile. The second one, which is a D K & S crew performing a number of [185] switch moves on these same tracks, was made from this point right here (indicating a star).

* * * *

A. There is the depot at Kensett, Arkansas. The Missouri Pacific local train No. 740 is approaching the Kensett depot on the main track. One of the crew members got off on the left side and went in the depot. They are making a stop that cut off the cars to be delivered to the D K & S. You see the engineer and see two of the trainmen, they are moving northward to the north switch to set out the cars. That is the third trainman, the brakeman. They have stopped north of the switch, and one of the brakemen lines the switch. There are three men standing there talking, one of them is the D K & S conductor. One man lines the switch. That is the D K & S conductor and one of the Missouri Pacific local crewmen. That covered hopper car is the Cabot car that they took by and had to set out at Kenset, to take back. They kicked it in one of the yard tracks. That is the D K & S conductor on the crossing. That is three of the Missouri Pacific crewmen [186] trying to help the car a little bit to get it in the clear. The car didn't quite clear, so they give a little bump to knock it clear of the track on which they delivered D K & S cars. Now, they have shoved the delivery on the D K & S engine, shut the Missouri Pacific engine off. They will get back on the train and proceed northward with the train on the main track. That is two of the brakemen on the leading end of the Missouri Pacific engine. Two of the brakemen standing there talking, one man coupling the

engine to the train. That is train Number 740 leaving Kensett northward. The D K & S crew, after the car was coupled to the engine, shoving the caboose ahead of them back to Searcy. That is a three-man crew. The conductor and brakeman are on the rear of the caboose, and the engineer is in the cab of the engine. This film was made on March 10. This is a D K & S crew arriving at Kensett. They brought eighteen cars from Searcy to Kensett, cut them off on the Y. They are going to take their engine and switch out some cars. That is a three-man crew. That is the brakeman Helm on the ground, Engineer Hickman on the engine—that is Brakeman Helm giving the signal, lining the switches. That is conductor Anderson that has stepped to the ground, and Brakeman Helm on the front of the engine. Brakeman Helm protecting the crossing, giving the signal at the same time. Brakeman Helm stopped the movement to clear the [187] switch, line the switch, crossed over, and he is giving a back-up signal. That is Conductor Anderson, he was on the crossing. Helm riding the cut of cars, made the coupling. Conductor Anderson handling that switch. Flag the traffic, and a move was made over the crossing. Brakeman Helm lines the switch, and he is walking back to the crossing to protect the crossing. At this point they have a whole of eighteen cars with the engine making a set-out for the Missouri Pacific delivery. That is a pedestrian walking across in front of Brakeman Helm. The cars have been assembled and set out on an auxiliary track for the Missouri Pacific crew to pick up. Brakeman Helm giving the signals, lines the switch, protecting the crossing. Now this film was made at McGehee on the same day, March 10, and it is the 7:00 a. m. to 3:00 p. m. yard engine. It shows one of the crew members standing in front of the switchman. There is two of the crew members talking. The engine was up north of there spotting some cars. During this time the engine was switching south of that point some 550

feet south of there. Now the engine has come back northward to a point just opposite the switch. There is, the crew is now tying up. The three of the ground members all going off duty.

Mr. Light: When the film is rewound, I will offer that reel into evidence as Plaintiff's Exhibit 105.

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[188] Mr. Youngdahl: We renew our objection. I think the movie itself illustrates the very nature. For example, when one of the people depicted begins to go in between the cars, the movie would cut off, and would resume again when he was in a less dangerous circumstance. For example, the pictures of the local railroad in Kensett were taken much closer in a place where obviously at a place to be discovered, and the hurrying members of the local crew were much better depicted because of that physical difference than the slower walking members of the Missouri Pacific crew at the same intersection were taken much further away. It is that kind of thing that illustrates the infirmity as a basis of our rejection. We renew it at this time.

Judge Van Oosterhout: Same ruling.

* * * *

[189] **MR. JOE BORGETTE,**

being called to the witness stand on the part of the Plaintiffs, after being duly sworn, testifies as follows:

Direct Examination,

By Mr. Light:

Q. State your name, please. A. Joe Borgette.

Q. Where do you live? A. Little Rock, Arkansas.

Q. What is your occupation? A. I am a photographer of Investigator, Special Agent, Inc.

Q. What experience have you had in the field of law

enforcement? A. I was with the State Police briefly, four years with the sheriff's department in Pulaski County.

Q. Did you take the moving picture that has just been shown? A. Yes, sir, I did.

Q. What type of camera or equipment, photographic equipment did you use? A. I used a Bell & Howell cartridge type camera, 16 millimeter with a six inch tele-photo lens.

Q. Was the camera on a tripod? A. Part of time the tripod was used, and part of the time it was hand-held.

Q. How far were you from the railroad operation that you were photographing in the first picture show, the Missouri Pacific train coming into Kensett? [190] A. Mr. Light, I used various distances. At one point the fartherest distance I would say was approximately 600 feet, or thereabout.

Q. Do those photographs that have just been shown to the Court fairly represent what you saw there that day? A. That is correct.

Q. Was there any effort made on your part to exclude movies of the crew members doing dangerous things? A. No, sir, it was not.

Mr. Lessenberry: I object to his leading.

Q. Have you taken some moving pictures at McGehee, Arkansas? A. Yes, I have. On March 14, sir.

Q. Who directed you or engaged your services to do that? A. Mr. Glenn Sheppard, General Manager of the Missouri Pacific Railroad.

Q. What instructions did he give you pertaining to what you should do at McGehee? A. Mr. Sheppard instructed me to park a vehicle just west of the switch shack and take photographs of that area.

Q. Can you come down to Plaintiffs' Exhibit 106 and point out to the Court where you positioned yourself at McGehee. A. I was positioned just behind the Safeway Store, approximately 200 feet from this shack right here (indicating).

Q. Is that a point designated on Plaintiffs' Exhibit 106 as surveillance point? [191] A. Yes.

Q. Is there a bench shown on these pictures at McGehee? A. Yes, sir.

Q. Point that out on 106. A. The switchmen's shanty is here (indicating) and then the bench is located here.

Q. Mr. Borgette, you can resume the stand.—What were your further instructions as to what you were to photograph down there? A. Mr. Sheppard instructed me to take fifteen minutes of film in an eight-hour period.

Q. What eight-hour period? A. From 7:00 a. m. on the 14th until 3:00 p. m. the same date.

Q. Was there some particular switch crew that you were to make this film of? A. Just the switch crew working in McGehee at the time.

Q. Would you tell us what you did? A. I got a camper, drove into McGehee, Arkansas, arriving there at 6:30 a. m., parked this camper behind the Safeway Store, set up a camera and tripod in the camper.

Q. What observations did you make there? A. At approximately a quarter until seven the crew reported for work at the switch shack. The engine started working shortly thereafter. My vision was blocked by two freight [192] trains parked along side the railroad spur track, and I was not able to see the exact time the crews went to work or who the crews were.

Q. Have you made notes of the observations you made during this eight-hour period? A. Yes, sir, I have.

Q. Would you refer to those notes and tell the Court what observations you made during that period? A. At 7:00 a. m. switch engine crew was at work. View blocked by freight train, not able to see the switch track. 8:00 a. m. no activity at the switch shack, switch crew still working. 8:30 switch engine No. 378 went to the east yard with three crew members on the engine—engineer, fireman and one brakeman; 8:50 a. m. switch engine with four crew members returned to the depot area—two

brakemen, one engineer and fireman on this train; 8:55 two of the switch crew, possibly the foreman and one other went up on engine 310, went east of the depot, four crew members still on engine 378; at 9:10 a. m. engine 378 took about seventeen cars to the east yard—four crew members on this train; 9:35 engine 378 returned to the depot area with forty-nine cars and four crew members present—two brakeman, engineer and fireman; at 10:00 a. m. unit 260 now working south of the depot, changed switch engines; 10:05 a. m. expose approximately twelve feet of film of two men sitting on bench in [193] front of the switching shack. They were on this bench four minutes. The switch engine was located south of my location at the time.

Q. Was the switch engine working at that time? A. Yes.—At 10:15 a. m. I photographed three men sitting on a bench near the track and switch shack, exposed thirty feet of film Tri-X on setting of F22 at 16 frames per second at about two hundred feet.

Q. During this period where was the engine and what was it doing? A. It was south of my location, sir.—A train blocked me at this point, and my observations were blocked completely.

Q. Until when? A. Until 1:05 p. m. I exposed forty feet of film of two crewmen seated on a bench. They were seated approximately fifteen minutes.

Q. Where was the switch engine at that time? A. The switch engine was located just south of my location near the depot, working up and down the track. At 1:20 p. m. I exposed eight feet of film of brakemen standing around the switch shack. At 1:30 p. m. exposed about ten feet of three crew members standing and talking south of the depot.

Q. Where was the switch engine at that time? A. It was beyond, south of the depot beyond my observation. [194] At 1:40 p. m. exposed fifty feet of three of the crew members, two on the bench and one was in the

shack. The man in the shack came out, sat on the bench while one brakeman left to throw a switch or something. I don't know; I am not familiar with railroads. At 1:50 p. m. switch engine is located on the southeast of the depot. Four crew members with the engine.

Q. Was it working? A. Yes, sir, it was out of my sight for quite sometime. At 2:20 p. m. exposed forty feet of film of brakeman seated on bench, also other crew members talking to brakeman. At 2:25 p. m. I filmed one crew member going into the house north of the depot, then go to his car, then he went across the tracks to the switch shack, and went inside. At 2:45 p. m. the switch crew all quit and went to their cars and left the yards. I terminated at 3:15 p. m. this date.

Q. Mr. Borgette, during the eight-hour period you observed that switch crew, did you ever observe six men to be working at one time? A. No, sir.

Mr. Youngdahl: I object. I don't know how Mr. Borgette can say what working means. He says he is not familiar with railroads. He said he saw two crew members talking to each other. It seems quite likely to me, quite possible at least, that they were talking and working. [195] A lot of people talk and work, including Mr. Light. I think it is improper questions which the witness cannot possibly answer competently.

Judge Van Oosterhout: It may be a question as to whether he knows enough about railroads, duties and chores as to whether they are working or not. I think it had better be directed in a way as to what he observed, Mr. Light.

Mr. Light: I will rephrase the question.

Q. During that eight-hour period did you ever see as many as six men on or about the engine apparently doing anything in connection with the engine? A. No, sir, I did not.

Q. During that eight-hour period did you ever see as

many as five men so conducting themselves? A. No, sir, I did not.

Q. What is the maximum number of men during that period that you saw apparently busy on or about the engine? A. Four men.

Mr. Lessenberry: I object whatever it means apparently doing something. If the witness knows, let him tell the Court what he did see, and let the Court draw its own conclusions as to what efforts these men were making. The question is improper and calls for a conclusion of the witness based on the witness, and it is speculative.

Judge Van Oosterhout: I think we will let him answer. The witness shouldn't testify beyond his ability as to what they [196] are doing. Just directed to what he observed.

Mr. Light: I believe he answered.

A. Four crew members.

Mr. Light: May it please the Court, I have an additional witness, Mr. Halferty, who is trainmaster for the Missouri Pacific at McGehee who can identify the individuals on this crew that are shown in the movie. Now, what I would like to do is have Mr. Halferty sworn so that during the showing of the movie he can tell the Court who these people are and identify them as members of this switch crew.

Judge Van Oosterhout: Do counsel for the Intervenor have any objection to this order and to reserve his cross-examination to all of them later, or do you prefer to have your cross-examination now.

Mr. Lessenberry: Defendants have no objection.

Mr. Youngdahl: No objection.

Judge Van Oosterhout: All right, we will proceed in that way, Mr. Light. The witnesses will all stand by for cross-examination.

[197] **MR. D. L. HALFERTY,**

being called to the witness stand on the part of the Plaintiffs, after being duly sworn, testifies as follows:

Direct Examination,

By Mr. Light:

Q. State your name. A. D. L. Halferty.

Q. Where do you live? A. McGehee, Arkansas.

Q. What is your occupation? A. Trainmaster, Missouri Pacific Railroad.

Q. And what are your general duties in that job? A. Supervision of the yard crew at McGehee, Arkansas, and also the road crew.

Q. How long have you had that job? A. I have been in McGehee two years last February.

Q. Mr. Halferty, will you step down to Plaintiff's Exhibit 106.—Can you identify that as a plat of a section of the McGehee yards? A. Yes, sir.

Q. What is the structure that appears on Plaintiffs' Exhibit 106 and designated as switchmen's shanty? A. A small building on the east side of our yard at McGehee, primarily for shelter. It has a water cooler inside.

Q. Is there a latrine inside? [198] A. No, sir, not inside this building.

Q. There is a water cooler? A. Yes, sir.

Q. Is there a bench near that shanty? A. Yes, sir. There is a bench and yard speaker just to the north of the building, and also either on the inside of the building or the outside there is a portable bench. I have seen it on the inside of the building and I have seen it on the outside.

Q. Have you had an opportunity to view the movies that Mr. Borgette just testified that he took at McGehee? A. Yes, sir.

Q. When he refers to the engine working to the south, what area of Plaintiffs' Exhibit 106 would it be? A. It would be in this area down here (indicating).

Q. What sort of switching operation does the 7:00 a. m. to 3:00 p. m. switch crews do in that section of the yard? A. This is our classification yard, and they are classifying the cars which are in the yard.

Q. Is there a large structure or shed that appears in some sequence of these movies? A. Yes, sir, that is our car shed. We call it the rip track.

Q. Point it out on Exhibit 106. A. Right in here (indicating).

[199] Q. What type of switching operations are conducted to the north of the place Mr. Borgette placed himself? A. To the north we have several industry tracks. We have an Adcock Grain track, elevator track, machine track, old stockyards, stock pen track. Several industry tracks which we spot cars on for industry.

Q. Will you resume the stand.—Is the switch crew that worked on March 14, 1967, from 7:00 a. m. to 3:00 p. m. under your jurisdiction? A. Yes, sir.

Q. What size crew is that? A. Six-men crew.

Q. And likewise is the crew that worked on March 10 during that period under your jurisdiction? A. Yes, sir.

Q. The same size crew? A. Yes, sir.

Q. I hand you four instruments and ask you if you can identify them? A. One is the engineer and fireman time slip for March 14, one is the switchman's time slip for March 14, 7:00 a. m. to 3:00 p. m., one is the engineer and fireman's time slip for March 10, 7:00 a. m. to 3:00 p. m., and one is the switchman's time slip for March 10 from 7:00 to 3:00 p. m.

Mr. Light: I mark these collectively Plaintiffs' Exhibit 107.

[200] Q. On March 14 who were the members of the 7:00 a. m. to 3:00 p. m. switch crew? A. The engineer was J. W. Pention, the fireman was M. L. Adams, engineer foreman A. E. Leasure, J. B. Shultz, R. B. Markham, and E. B. Short.

Q. On that day was that the only switch crew switching

in the McGehee yards between 7:00 a. m. and 3:00 p. m.? A. Yes, sir.

Q. What was the general duty of that crew that day? What sort of assignment or work would they tend to? A. They had the trains to work. I believe there were two there that morning, two in-bound trains. They had the McGehee business that they took off these trains, switched and classified, and their normal industry business to do.

Q. Was the work done and to be done on that day typical of that usually done at the McGehee yard? A. Yes, sir.

Q. Do you personally know these six men? A. Yes, sir.

Q. Do you recognize them in the movies that are about to be shown, and can you identify them to the Court? A. Yes, sir.

Q. Does the movie reflect some of these men sitting on a bench and standing around the switch shack according to [201] Mr. Borgette's testimony. Were you aware that this was the practice in the McGehee yard? A. Yes, sir, I know that is a factor.

Q. These men work under your jurisdiction and supervision? A. Yes, sir.

Q. Did you ever get on them for sitting on the bench and standing around the shack? A. No, sir, we are required to have six men on the crew. We have work for four, and they perform it efficiently and safety. I have never criticized them.

* * * *

Judge Van Oosterhout: Do you wish to make the same objection to this film as the last? Any objection to it?

Mr. Youngdahl: Yes, sir, the same objection.

Judge Van Oosterhout: Very well. Then I think we are ready to show the film.

[202] A. The fellow in the light cap is J. B. Shultz, and the man in the dark cap is the foreman, A. E. Leasure. The engine is somewhere to the south or north. That is the switchman's shanty that is located on the east side of

McGehee yards. The fellow reaching in his pocket is E. B. Short.—That is a picture of J. B. Shultz and Mr. Leasure again.

Q. Are all three of these members of the crew? A. Yes, sir. They are all three members of the 7:00 a. m. to 3:00 p. m. switch crew.—Now, the fellow with the hat on in the dark clothes is R. B. Markham, a helper, on the 7:00 a. m. job. And this is still the shanty on the east side of the track of the McGehee yard.—That is the same picture of them. Engine Foreman in the light clothes, Mr. Leasure, and the fellow in the dark clothes is Mr. R. B. Markham.

Q. Are they performing any services for the railroad company at this time? A. No, sir.

Mr. Youngdahl: We object.

A. R. B. Markham and A. O. Leasure, still a picture of the shanty on the east side of the track.—That is the picture of the foreman there with the list in his hand.—R. B. Markham, helper.—Another picture of R. B. Markham.—That is a picture of the repair shed. The man in the white [203] shirt and hat is the general yard master, Mr. Huto, George Huto. He is evidently giving the crew some instruction.

Mr. Youngdahl: We object.

A. The fellow with the hat off is E. B. Short. He is a member of the 7:00 a. m. crew, and that is R. B. Markham in the dark clothes again.—That again is the picture of the switchman's shanty at McGehee.—That is the foreman that walked out the door, A. O. Leasure.—That is another picture of the foreman, A. O. Leasure.—There is the rip track shed to the left of the engine, R. B. Markham on the board there.—It gives another shot of Mr. Leasure.—That is a shot of the depot at McGehee, Arkansas, north end.—That is the engineer, the fireman is running the engine and the engineer is on the fireman's side, J. W. Penton.—Another shot of R. B. Markham. He was a helper on this train engine.—That is a picture of the track

man doing some work there on the track.—The fellow in the checked shirt is J. H. Stewart, he is a section switchman, goes to work at 3:00 p. m. He hadn't gone on duty yet. He is talking to R. B. Markham, a member of the crew that is on duty.—That is a picture of the foreman, A. O. Leasure.—That is another shot of A. O. Leasure.—That is a track man cleaning out between tracks——

Mr. Light: 108 is this film. When the film is rewound I want to offer it as Plaintiffs' Exhibit 108. I [204] would also like to offer the plat identified by Mr. Halferty as Plaintiffs' Exhibit 106.

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Mr. Light: Let me offer all exhibits through 108 that the Plaintiff has tendered this morning, that is 103 through 108.

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Judge Van Oosterhout: Do you have any preference as to which order you take the witnesses? I suppose we might as well finish these two shorter ones before we resume with Mr. Sheppard. Mr. Borgette is on the stand. Maybe we might as well cross-examine him.

JOE BORGETTE.

Cross-Examination,

By Mr. Youngdahl:

Q. Mr. Borgette, the two movies that we have just seen, what was the total length of time of each movie? A. The Kensett movie was approximately ten minutes, and the McGehee movie was eight minutes.

[205] Q. Do I remember correctly that the first movie had a few sequences from McGehee as well as Kensett? A. That is correct, sir.

Q. How long was the total exposure at Kensett for the first movie? A. Approximately ten minutes.

Q. How long was the total exposure for the Missouri Pacific operations at Kensett in the first movie? A. I would say around twelve to fourteen minutes, sir.

Q. Perhaps I am misunderstanding you, Mr. Borgette. The Missouri Pacific operation at Kensett was a portion of the first movie. Isn't that correct? A. That is correct.

Q. And how long was the film that related in the first movie, the film which related to the Missouri Pacific operations at Kensett? A. I misunderstood you the first time, Mr. Youngdahl. The films at Kensett run approximately eight minutes, and the film at McGehee, Arkansas was ten minutes.

Q. Referring now to film one and film two? A. That is correct.

Q. Now, in film one, how many minutes of that film approximately referred to Kensett as distinguished from McGehee? A. Would you rephrase that. I don't quite understand you.

[206] Q. In film one there were scenes taken at Kensett, Arkansas, and at McGehee, Arkansas. Isn't that correct? A. That is correct.

Q. A few at McGehee? A. Yes.

Q. How many minutes at McGehee, say, in film one? A. Ten minutes—oh, film one?

Q. Yes. A. Approximately two minutes.

Q. All right. So it means, I guess, that there are approximately six minutes at Kensett. Is that correct? A. That is correct.

Q. Of that six minutes, how was it divided between Missouri Pacific and at other Doniphan, whatever that other railroad was? A. The Missouri Pacific train pulled out, and as they pulled out I panned over and got the D K & S pulling out going towards Searcy.

Q. Does your recollection or do you have notes which reflect how much of that time was spent on the Missouri Pacific? A. No, sir, I do not have notes on that particular assignment.

Q. Now, when you were sent by Mr. Sheppard, or went with Mr. Sheppard to these various locations, did you have film with you in excess of the film that you used to take pictures received? [207] A. Yes, sir, I did.

Q. Were you given any instructions at either location as to whether or not the people you photographed should know that you were present? A. Yes, I was.

Q. What were those instructions? A. The film at Kensett I was suppose to stay out of sight, that is, the first segment. On the second segment of the D K & S crew I was stationed in the broad view of the train crew.

Q. And could you tell us your observations as far as the train crew looking at you and so on, whether or not they realized the D K & S train, whether or not they realized you were there? A. I couldn't answer that, and couldn't qualify. I didn't know what they thought about me being there.

Q. Perhaps you have already said, but how much closer were you when you took the films in Kensett of the local train than you were of the Missouri Pacific operations? A. The film was shot at various distances. It would be a hazard to say what the distance was. At times it was close and at times it was over six hundred feet.

Q. Did your instructions from Mr. Sheppard or anybody else with the Missouri Pacific vary as to whether or not you [208] should let the two different railroad crews see you, that is, the Missouri Pacific did not see you, but didn't make any difference as far as the other line? A. That is correct.

Q. Were you in fact instructed that the employees of the other line should see you when you took pictures? A. No, sir, they didn't say either way, just stay out in the open and take some pictures.

Q. Stay out in the open as to the—— A. D K & S crew.

Q. D K & S, whereas you were to remain in secret as to the Missouri Pacific? A. That is correct.

Q. And how about your instructions in that connection in McGehee. Were you instructed anything about whether or not the people should see you? A. I was instructed to get a camper and to be out of sight at McGehee.

Q. Were you given any instructions on any of the trips that you made in connection with these movies concerning where you should point your camera, that is, what kind of things you should take? A. No, sir, except that I was immobile. I could not move the camper in McGehee, and I just shot when the opportunity arose when I was not blocked, which was a greater part of [209] the time that I was blocked by the freight trains.

Q. What seems clear, Mr. Borgette, for example, on the McGehee movies that you were focused on the events in front of the switching shack more than probably any place else. That is correct, isn't it? A. That is correct. Like I say, I was immobile, and that was the target of opportunity at the time.

Q. Were there times during the day where there were other targets of opportunity for you? A. Well, sir, like I say, I was blocked by a freight train the majority of the time I was in McGehee, and this frequence on the bench was taken one time at 10:05 and then later at 1:05 is when the train left and I had a broad view of the switch shack and part of the railroad yard.

Q. Do I understand that you are testifying that the only reason that you focused on the bench in front of the switch shack that that was just the most convenient picture to take in that whole operation? A. Mr. Youngdahl, I was stationed to where I could see the switch shack where most of the activity would take place, possibly.

Q. Were you instructed as to where you should be stationed as far as what you would be able to see is concerned? A. That is correct.

[210] Q. Were you instructed to be in a position to where you could most easily see the switch shack? A. That is correct.

Q. Did you take during the course (Strike that)—Let me ask you. How many hours were you in McGehee on your trip? A. I arrived at McGehee from, at 6:30 a. m. and departed McGehee at 3:15 p. m.

Q. During the course of that time were you always able to observe the bench in front of the switch shack? A. No, sir, I was not.

Q. How much of that, what percentage of that time were you able to observe that bench? A. For a brief period of time from 10:00 to 10:05 a. m., then from 1:05 p. m. until 3:00 p. m. this date.

Q. How many different engines were being operated by railroad personnel in McGehee on the day you were there? A. Mr. Youngdahl, I don't know a switch engine from a pulling engine. I just saw two engines in the switch yards, one was 378 and one was number 10. I cannot designate the type engine they were, because I am not familiar with railroading.

Q. On any of the occasions when you saw men talking, and you showed in your movies men talking, on any of those occasions did you know what they were talking about? A. No, sir, I did not.

* * * *

[211] Q. Why, Mr. Boegette, did you on some occasions use the Tripod and some not? A. Mr. Youngdahl, when the opportunity arises I would rather use a tripod because of tele-photo lens. When you hold a tele-photo lens in your hand you have a great shaking about it. If the opportunity arises where you can use a tripod, it is desirable.

Q. Why did that opportunity present itself on some occasions and not on others? A. The first time in Kensett I was stationed in my car, and the camera was hand-held with a tele-photo lens.

Q. Did the tripod relate to the fact that you were trying to hide yourself when you were taking that first sequence

of pictures in Kensett, wherein later on you were not trying to hide yourself? A. The first sequence I was in my car taking photographs. On the second sequence in Kensett with the D K & S I had [212] a tripod and I was out in the open.

Q. Have these pictures that you have showed us been edited in any manner? A. No, sir, they have not been edited or cut in any manner.

Q. Every foot or frame of film that you took on those days are reflected in pictures that we have seen? A. Yes.

Q. Why did you not take any more film than the ones you did take? A. My instructions were not to get over fifteen minutes of film, so it wouldn't burden the Court.

Q. Okay, thank you.

Further Cross-Examination,

By Mr. Lessenberry:

Q. What was the weather at the time you took the photographs at Kensett and McGehee? A. Mr. Lessenberry, the weather was cloudy and cold.

Q. It was not raining? A. No, sir, it was not.

Q. You remarked that you worked for the Pulaski County Sheriff's Office. Is that correct? A. Yes, sir.

Q. How long were you so employed? A. Four years.

[213] Q. Did you work in civil process or criminal division? A. I was in the county jail, captain.

Q. In that capacity were you taught or did you learn to use a movie camera? A. No, sir.

Q. That was not part of your duties, was it? A. No, sir.

Q. And how long were you with the State Police? A. Two years.

Q. Were you in CID? A. No, sir.

Q. What was your work? A. Patrolman and also aide to Governor Cherry.

Q. Drove his car? A. Yes, sir.

Q. The notes that you have read to Mr. Light, are those your original work notes you took at the time? A. Yes, sir.

Q. Those are all the notes that you took throughout the afternoon? A. Yes, sir.

* * * *

[214] **Redirect Examination,**

By Mr. Light:

Q. Are the films that you have shown here this morning all of the films that you took at the direction of Mr. Sheppard or any other railroad representative? A. That is correct.

Mr. Light: Thank you.

* * * *

[215] **MR. D. L. HALFERTY,**

being recalled to the witness stand for cross-examination, testifies as follows:

Cross-Examination,

By Mr. Ross:

Q. What is your official title, Mr. Halferty? A. Trainmaster, Missouri Pacific.

Q. And McGehee is territory which is under your supervision? A. Yes, sir.

Q. Including the yard at McGehee? A. Yes, sir.

Q. You referred to the yard as a classification yard. Is this an automatic electrical classification yard such as the one at North Little Rock? A. No, sir, it is not.

Q. Flat switching is performed here at McGehee? A. Yes, sir.

Q. And what is flat switching, Mr. Halferty? A. That is where you use an engine to kick the cars. There is no gravity, it does not have a hump, or not a gravity yard, such as North Little Rock.

Q. The cars are kicked on the various tracks and tied down by members of the crew? A. Yes, sir.

* * * *

[216] Q. How many crews are on duty at the McGehee yard at any one time? A. We work three regular crews, 7:00 a. m., 3:00 p. m., and 11:00 p. m.

Q. There is one switch crew on duty from 7:00 to 3:00? A. Yes, sir.

Q. Reference has been made to three different engines, Number 378, 260 and 287. Was this one switch crew?— Pardon me, two switch engines on this particular day, 378 and 260. Does this same crew operate these engines? A. Yes, sir.

Q. I believe the 7:00 a. m. crew changed engines there at one point during the day—I believe Mr. Borgette mentioned another engine also, Number 310. Is that an engine that this crew also operates? A. I couldn't say. I wasn't at McGehee that morning, and I am not familiar with the 310, what duties. It might have been a local engine, one of the locals. I don't know.

Q. Would the switch crew have any duties to perform in connection with the local? A. Not with the engine going on the local. It would with the local if it went to making up the local train for departure.

Q. The switch crew makes up the local train in McGehee? A. Yes, sir.

[217] Q. In the course of the performance of the duties of the switching of crews, is it necessary for the crew from time to time to confer with each other? A. Yes, sir. In a sense for them to confer with each other. It is normal to see them talking with each other, yes, sir.

Q. In referring to Exhibit 106, are these the tracks on which the cars are kicked for purposes of switching? A. Yes, sir. To the right, the tracks to the right of the rip track, or the repair shed, this is our yard.

Q. On this side? A. Yes, sir.

Q. What are these tracks? A. That is the repair track, and we call them the caboose track, and the oil track, fueling track, fueling facilities, and the roundhouse.

Q. Are there any crossings on this particular area of the track shown on Exhibit 107?

Judge Van Oosterhout: Exhibit 106.

A. There are some crossings to the north which are not shown on the map.

Q. Is this north to the left? A. Yes.

Q. The left of the map will be north? A. Yes, sir, to the left of the map.

[218] Q. How many public crossing are there there. Do you know? A. Three.

Q. In addition to the track on which trains are built, on which normal switchings, normal yard operations are conducted, I believe you mentioned some industrial tracks—some industrial tracks have been mentioned by Mr. Borgette or you—they are located to the north? A. Yes, sir.

Q. Does this same switch crew perform switching at those industries? A. Yes, sir, when it is required.

Q. And I take it that since the public crossings are to the north of this particular diagram shown here, that switching would take place over those tracks in switching those industries? A. Yes, sir.

Mr. Ross: I believe that is all.

Further Cross-Examination,

By Mr. Lessenberry:

Q. Is it correct that you stated you were out of town when these photographs were taken? A. Yes, sir. I arrived in McGehee on the afternoon of the 14th it was somewhere around 12:30 or 1:00 o'clock. Something like that.

[219] Q. Was this a time when you would ordinarily be out of town? A. Yes, sir, I was coming in with the superintendent. I had been to Pine Bluff and was coming south, and I was with him.

Q. Had you been sent out of town by Mr. Sheppard or any other railroad official? A. No, sir.

Q. This was a part of your duties to leave town occasionally, and you were out of town on this particular day? A. Yes, sir.

Q. From your testimony and diagram that has been presented to us, apparently this switching shack is located in a rather centralized area between the classification yards and the industrial yards, one to the south and one to the north, respectively. Is that correct? A. Yes, sir.

Q. Then the switching shack is a central location for the switchihg location of cars, rolling stock, from one to the other, and vice versa? A. Yes, sir. And it is located directly across the tracks from our yard office where our general yard master stays and so forth.

Q. Are those switches hand operated? A. Yes, sir.

Q. Now, in the lower part of the diagram there are two other [220] lines. Are those main line tracks? A. No, sir, we have one main line, one main track, and I believe that is the one that is in green, and the other tracks are actually our yard tracks which have been extended to handle long trains.

Q. I will ask you if you had given these switch crews any instructions at a time when the portion of the crew would conduct switching operations in the classification yard to the south that one or more of the members stay at this central location to guard or line the switch? A. No, sir, I haven't given that instruction to that effect.

Q. Is that the practice? A. That is the practice, yes, sir.

Q. A helper or brakeman can watch this switch just as well sitting down, I suspect, as standing up, could he not, sir? A. Well, yes, but in a yard with yard track switches there is no occasion to watch the switch.

Q. That particular switch will be thrown several time in the course of a working day, will it not, sir? A. Yes

would imagine that most all of the switches would be thrown several times in the course of a day's work.

Q. And if a portion of the crew were in the classification yard and came out of the classification yard to the juncture of one of those switches, a man there positioned to throw the switch would save time for the engine or rolling stock to get out of that switch? [221] A. Well, if the switch was lined against him, but, in other words, if the lead was lined when the engine went down into the track there would very rare occasions for a switch to be against the same move coming out.

Q. There are other moves, I believe, that are conducted through the course of the day, are there not, through these switches? A. Not too many.

Q. But there are some? A. This is the only crew that is working.

Q. How long has that bench been there that you know of? A. There has been a bench there ever since I have been in McGehee.

Q. Furnished by the carrier and maintained? A. I don't know whether the carrier furnished it. I presumed it was the ingenuity of the crew that they found them some place to sit down.

Q. You have seen it there and you have permitted it to be there? A. Yes, sir.

Q. You could remove it if you desired to do so, couldn't you? A. Yes, sir.

* * * *

[222] **Redirect Examination,**

By Mr. Light:

Q. Mr. Halferty, by referring to Plaintiffs' Exhibit 107 could you tell us what engine that switch crew on March 14 used during the 7:00 a. m. to 3:00 p. m. assignment? A. He used engine 378 and engine 260.

Q. Does the exhibit reflect the time when he changed

over from one engine to the other? A. Yes, sir, under "remarks" it says "changed engine at 10:30 a. m."

Q. He would not have been using both engines, the crew would not have been using both engines at the same time? A. No, sir.

* * * *

Recross-Examination,

By Mr. Ross:

Q. Does this switch crew get a regular lunch period? A. Yes, sir, they get a lunch period.

Q. What duration? A. Twenty minutes. That is the time called for.

Q. Do they get any regular scheduled breaks during from 7:00 a. m. to 3:00 p. m.? A. No regular breaks, but I do know that they get their coffee [223] of a morning, but there is not a regular scheduled break, or anything like that.

Mr. Ross: Thank you.

Further Redirect Examination,

By Mr. Light:

Q. What time do they take their lunch break, Mr. Halferty? A. Well, they usually try to take lunch around twelve noon. It depends on the work the exact time they go. That is up to the yard master's discretion as long as he doesn't work them more than five hours and forty minutes before. That is as long as he can work them before he lets them go eat.

Further Recross-Examination,

By Mr. Lessenberry:

Q. During the time that these photographs were taken was the switch crew in the operation of a classification yards up to their peak load? A. No, it wasn't a peak

load. It was probably an average day. Like I say, I arrived in McGehee that afternoon, and I didn't pay particular attention to the amount of work to be done and had been done that day.

Q. McGehee is located in the rather central part of the agricultural section, is it not? A. Yes, sir, it is.

Q. You all have a lot of business, or railroading business [224] during, say, harvest time? A. Yes, sir; we do.

Q. More than other times? A. Yes, sir.

Q. This is true in relation to some of the industries that you have there? A. Yes, sir, that is correct.

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[225] **MR. J. G. SHEPPARD,**

being recalled to the witness stand for cross-examination, testifies as follows:

Cross-Examination,

By Mr. Ross:

Q. Mr. Sheppard, you testified, I believe, that during your days as a brakeman on the Gurdon to El Dorado subdivision that your duties were to aid in making a set out, pick up the cars, switch cars, keep a lookout, inspect the train, set hand brakes and load and unload L. C. L. freight. Is that a fair statement of your testimony? A. Yes, sir, it is.

Q. Mr. Sheppard, does the brakeman still aid in making set-outs and pick up of cars? A. Yes, sir.

Q. Do the brakemen still aid in the switching cars? A. Yes, sir.

Q. Do the brakemen still perform lookout duties? A. Yes, sir.

Q. Do the brakemen still inspect the trains? A. Yes, sir.

Q. Do the brakemen still set handbrakes? A. On occasions, yes, sir.

Q. Don't they set hand brakes each time they set a car out? A. No, sir, not each time they set out a car.

[226] Q. They might kick it into another car, couple it into another car with the hand brakes set? A. If a car is set out on a level track, it is not uncommon to leave it without a hand brake.

Q. Nothing to tie it down? A. Yes.

Q. Other than its own weight? A. That is correct. In most cases brakemen will put a piece of wood or some object under one of the wheels if there is a slight grade. If there is a pretty good grade they set hand brakes.

Q. Did the brakemen follow this same procedure when most of the cars were equipped with staff or stem-winder hand brakes? A. Practically the same, yes, sir.

Q. Would you say that much of the time the brakemen chocked or scotched the wheels on those cars rather than setting the hand brakes? A. It would be difficult to say what percentage of the time. It would depend upon where the work was being performed.

Q. Did the loading and unloading of L. C. L. freight take place on a local freight train or a through freight train? A. Primarily on local freight trains. It has been handled on through freight trains, and, of course, a through freight train does local work, they convert to local pay. But [227] ordinarily on the regular assigned local freight train.

Q. Every train would not have L. C. L. freight, would they? A. No, sir.

Q. I believe you said that the particular local on which you worked had only one to three cars of L. C. L. and all three of those, at times when it had three, all three of those would not be unloaded. Is that correct? A. Not in their entirety. It was a common practice to unload L. C. L. from as many as three cars, but not unload the entire car. Some of the L. C. L. would go beyond the destination of the run.

Q. You testified, I believe, that many of the local sta-

tions which were switched during the late '30's during your braking days are no longer open. Is that correct? A. Yes, sir, that is correct.

Q. And the trains have fewer stops, I believe you stated. A. That is correct.

Q. Mr. Sheppard, was one of the duties of the station agent or operator to stand at or near the track and inspect the train as they passed by? A. If his duties permit he is required to.

Q. Required by a rule to? A. That is right.

Q. To inspect the train when duty permitted? [228] A. That is correct.

Q. So the absence of these station agents today would provide fewer people to inspect the trains moving over the track, would it not? A. There would be fewer people employed on that particular subdivision, but not necessarily less inspections, because during that period the agents were fairly busy, and many trains that went by they were ties up on on the telephone or telegraph key and had no opportunity to inspect the train.

Q. Who performs the inspection today? A. The track men, bridge men, in fact all employees that are employed on or around the track are required by rule to inspect passing trains.

Q. And these same people that you commemorated were also expected and instructed to inspect the trains back while the stations were still open, weren't they? A. I believe that was the rule at that time. I am not positive. That is a maintenance away rule, and I am not sure about it.

Q. So closing many of the stations has lessened the force available or the people available to inspect trains? A. It possibly could have, yes, sir.

Q. When you mentioned inspection of the trains and people who [229] inspected trains, I don't believe you mentioned the crew itself. A. The crew does inspect the train at every opportunity.

Q. And this is at every stop? A. Not necessarily. A stop may be of such short duration that they have no opportunity to inspect. It is a broad rule and circumstances dictate whether or not they inspect the train.

Q. Mr. Sheppard, there are still conditions on your railroad which make it necessary for flag protection to the rear of the trains, aren't there? A. There are some, yes, sir.

Q. Mr. Sheppard, I believe that you stated that all your rolling stock purchased within the last ten years have been equipped with roller bearings. A. I don't believe I made that statement. I believe my statement was within the past three years.

Q. Three years? A. I believe that is correct.

Q. Do you know what percentage of your rolling stock you have been able to convert to roller bearings in that period of time? A. No, sir, I don't know what percentage. However, we have a large car shop at DeSoto, Missouri, and we operate it [230] eleven months out of the year. We produce from seven to ten cars per day, rebuilt cars through that shop. And they are equipped with roller bearings. I believe Mr. German testified in detail to that, if I am not mistaken.

Q. In Plaintiffs' Exhibit 82, which is answers of Missouri Pacific to the interrogatories of the Intervenors, and this exhibit is signed by Mr. John H. Lloyd, it is dated the 6th day of September, 1966. In answer to interrogatory number 45, how many freight cars used by your railroad inside Arkansas are equipped with roller bearings? The answer is eleven thousand one hundred fifteen. Interrogatory number 46, how many freight cars used by your railroad inside Arkansas are equipped with journal lubricator pack? Thirty-five thousand seven hundred twelve. So apparently your railroad has about twenty-five per cent of its rolling stock equipped with roller bearings from Mr. Lloyd's answer. The other seventy-five per cent are more susceptible to hotboxes, are they not, Mr. Shep-

pard? A. It depends on how they are equipped. I have no way of knowing if that includes the sleeve bearings or just how he arrived at those figures.

Q. The hotbox detector located at Mablevale inspects trains both ways, going in both directions? A. Northbound trains.

Q. Northbound trains only? [231] A. Yes, sir.

Q. The hotbox detector at McGehee inspects trains in which direction? A. Southbound.

Q. All the trains operated by Missouri Pacific in Arkansas do not roll over tracks on which the hotbox detectors are located, do they? A. No, sir, not all of them.

Q. It is still one of the duties of the train crew to keep a lookout for hotboxes? A. Yes, sir.

Q. Do you happen to know how many hotbox detectors each of the other plaintiff railroads has on its tracks in Arkansas? A. No, sir, I do not.

Q. You are not familiar with that? A. Not with the number they have, no, sir.

Q. Mr. Sheppard, in Plaintiffs' Exhibit 92, I understand it is a delay report, on what is referred to the Long Barrel Local between North Little Rock and Texarkana. Is this the complete delay report that has been offered as Plaintiffs' Exhibit 92? A. As far as I know it is the only delay report the conductor fills out. It is all he is required to fill out on delays.

[232] Q. Is there a portion of this report which is included on the back of the regular report? A. That is the complete report.

Q. No material is required to be filled in on the reverse side of the original report? A. Not that I know of.

Q. What portion of this report indicates the cars handled by this Long Barrel Local? A. There is a portion about the center of the report, from about the center down to the bottom provided for showing delays at stops and opposite the time shown for delays is shown the number of loads and empties handled.

Q. Is there a place to indicate the gross tons handled by this freight train? A. Yes, sir.

Q. Where is that? A. That is the left-hand column about the center of the page.

Q. Under remarks? A. No, sir. Below——

Q. Would you point that out to me, please sir. How many gross tons were handled on this particular freight train as indicated by this exhibit? A. This exhibit indicates that out of North Little Rock the train was handling 2848 gross tons.

Q. This is when it left the North Little Rock terminal? [233] A. Yes, sir.

Q. And how many did it handle on its trip to Texarkana? A. The report indicates that out of Hope he had 1144 gross tons, and that is the last delay shown, so apparently that is the tonnage into Texarkana.

Q. And what was the gross tonnage handled of all the cars handled on that particular run, on that particular day, as indicated by this exhibit? A. Well, he shows handled thirty-nine loads and eighty-five empty, nineteen forty-two, fifty-one sixty-six, and sixty-four zero six. Apparently the fifty-one sixty-six is the total gross tons handled.

Q. The conductor fills out this report, does he not? A. The conductor, it is his responsibility. Sometimes he lets the brakeman do it.

Q. The conductor in obtaining information to go on this report has to keep up with the gross tons of all cars handled between North Little Rock and Texarkana? A. Not necessarily at the present time to keep up with gross tonnage. He does keep up with the net tonnage, and the computers when the cars are wheeled at destination by the computers they figure the gross tonnage.

Q. The conductor then keeps up with the net tonnage of each car handled on the trip from North Little Rock to Texarkana? [234] A. That is correct. Apparently this conductor did figure the gross tonnage as well as the net tonnage as indicated by that report.

Q. Mr. Sheppard, Plaintiffs' Exhibit 93 is a wheel report. What train is that a wheel report of? A. That is train number 66.

Q. That is a through freight train? A. Yes, sir.

Q. Mr. Sheppard, on local freight trains would all entries on the wheel report be by IBM machines as this one is? A. They would out of the terminal, just as this one is.

Q. And what about the stops along the way? A. Stops along the way the conductor is required to enter on a wheel report the cars that he picked up.

Q. What information about those cars is required? A. The initial, number, net tons, contents, destination, and point of origin.

Q. And this information is required of each car handled by this train on the trip from North Little Rock to Texarkana? A. It is required, but it is not required that the conductor wheel any cars other than the cars he picks up between terminals, and at the terminals where clerical forces are employed, which are the points at which most of the cars are picked up. The clerical force fills out the [235] wheel report for him on those particular cars.

Q. Mr. Sheppard, my question had reference to the Long Barrel Local which I was speaking where station switching is performed. A. Where station switching is performed by the Long Barrel Local if he picks up cars for road haul movement in his train it must be entered on a wheel report. It could be done by the station force. If there is none at the particular point, the conductor is required to do it.

Q. The conductor is responsible for seeing that that is done? A. That is correct.

Q. This is true of all local trains, is it not, Mr. Sheppard? A. As far as I know, it is, on the Missouri Pacific.

Q. At other than major terminals in Arkansas the local freight conductor will have to prepare portions of a switch list also, will he not? A. That is a little bit too broad for me to give you a good answer, I am afraid. Now, are you

referring to switch list with which he performs his switching, or the list of his train, that is, the through portion of his train?

Q. You explain it to me, Mr. Sheppard. Tell me what switch list the conductor has, or obtains along the way. A. The conductor on a local, any local train that is picking up cars or switching industries is ordinarily furnished [236] a list of the work to be performed by the agent or a clerk where there are clerks employed.

Q. Of the work to be performed at that particular station? A. That is correct.

Q. What about cars picked up at that station. Do they have to be put on the switch list? A. They don't have to, but they ordinarily are so that the conductor will know what work is to be performed.

Q. Isn't the conductor required to maintain this switch list showing the cars in his train at all times? A. Now, as far as the through cars are concerned he is required to make a list of the train before arrival at the final terminal. He does that from the weigh bills. He doesn't have to walk the train to do it.

Q. In your testimony you mentioned blocking trains in station order. What do you mean by blocking trains? A. That means placing the cars together for any given point so they can all be set out without making a switch move to do it.

Q. These cars are usually block for towns which they are to be left. Is that correct? A. Towns or industries.

Q. Mr. Sheppard, will the cars be blocked for the particular industries at which they are to be left? A. Ordinarily they are, except if there are several industries [237] town. I am referring to industries between stations.

Q. If there is one industry located between stations then the car or cars for that industry would be blocked in the train, or would be all together in the train? A. That is proper, yes, sir.

Q. But if there are more than one industry in a town

or at one stop the train is to make, then the cars will not be blocked, will they? A. Not necessarily. In some cases that is done to eliminate delay on the road in switching out the cars.

Q. When the cars are not blocked this necessitates members of the crew performing flat switching. Is that correct? A. If there are more, if they have more than one car for one industry and they are not together, then they have to be switched. That is correct.

Q. In relation to Plaintiff's Exhibit 95, which is a picture of coal chute and a water tank. I believe you stated that the water tanks are located every fifteen to twenty miles and the train would have to stop at each one, or at least at every second one. Is that correct? A. No, sir, not exactly. I said ordinarily they were located every fifteen or twenty miles. Some of them could be a little farther. And it would depend uopn the tonnage handled whether or not they took water at every water [238] tank. Occasionally, they would run a water tank.

Q. Are you referring to an auxiliary (Strike that)—On a through freight would they not often be equipped with auxiliary water tanks on the train? A. In certain cases they would have an auxiliary water tank.

Q. And these tanks hold from ten to twelve thousand gallons of water? A. I believe back during that time less than that. Probably eight thousand. Some of them maybe ten thousand.

Q. There would usually be enough water for the trains to get between terminals without having to stop and take on water, would it not? A. No, sir, in some cases there would be, and other cases it was necessary to take water between terminals, even though the train had an auxiliary water tank. Of course, it was provided to eliminate water stops.

Q. At any rate, the train wouldn't have to stop every fifteen or twenty miles to take on water, would it? A. Not unless he had an awful lot of delays.

Q. I believe you stated in your testimony that coal would be taken on at division points? A. That is ordinarily where it is taken. I know there were some coal chutes between division points, but in most cases that is where the coal was taken.

[239] Q. Is a division point one in which the crews are changed? A. That, in most cases they change there, not in every case.

Q. Mr. Sheppard, I hand you Plaintiffs' Exhibit 96. This shows two steam locomotives coupled together. Is that correct? A. Yes, sir.

Q. If I understood you correctly yesterday, you said that this was typical of the things you observed back during the steam days. Is that correct? A. I believe I stated this was a typical steam engine that I observed back during the time that I was working as a brakeman.

Q. Perhaps I misunderstood you then. It wasn't typical at all then to see two steam engines coupled together, was it? A. It was not too unusual to see that, but most of the trains had one steam engine.

Q. Mr. Sheppard, there is another aspect of this picture which is not typical either.—(Strike that.)—When two steam engines are coupled together in operation would you have a total engine crew of four operating those two steam locomotives? A. Yes, sir.

Q. I believe there are only two people shown in that picture, are there not? [240] A. There are only two shown, and I am not even sure they are the engine crew. It could be the hostler and the hostler helper.

Q. At any rate, there would be a four-man engine crew plus the train crew operating a train pulled by two steam locomotives? A. If this engine consist were used in road service there would be two engineers and two firemen required.

Q. And this would be in addition to the train crew? A. Yes, sir.

Q. Mr. Sheppard, I believe you mentioned that the Mis-

souri Pacific had two radio maintenance people at the North Little Rock terminal and two at the Memphis terminal who performed other duties in addition to the maintaining the radios. A. That is correct.

Q. Do the two men at North Little Rock work on weekends? A. Their time is staggered so there is someone available on weekends.

Q. There is one man, one of these men is available each weekend? A. I believe that is correct. I am not thoroughly familiar with their days of assignment, but that is my understanding that their time is staggered so someone will be available.

[241] Q. What if a radio on a train becomes inoperative at Texarkana? A. I don't know what the radio maintenance situation is at Texarkana. That terminal is operated by the T. P. and I am not sure whether they have a maintainer.

Q. What about Van Buren? A. I don't know for sure about Van Buren. That is on another district.

Q. What about Cotter? A. I am reasonably sure there is none at Cotter.

Q. What would a train experiencing radio failure, how far would it have to go then to have its radios repaired? A. It may not have to go very far, because these men, they have transportation and they go to outside points when necessary to repair radios.

Q. Would the train stop and wait for these men to arrive to repair the radio before they moved the train? A. No, sir.

Q. Mr. Sheppard, I am speaking of a train in operation. A train coming south at Corning, Arkansas, experiencing radio failure. What action would be taken? A. If the crew did what they were supposed to do they would file a wire at the first available point of communication, to the responsible people in Little Rock, and if the engines [242] were going no further than Newport, probably the

radio maintainer would be dispatched to Newport to repair the radio. Otherwise, he would catch it when it got to Little Rock.

Q. The train would move either to Newport or Little Rock with inoperable radio? A. It is possible for that to happen..

Q. This would be true if the trains experienced radio failure at McGehee or El Dorado or any other outlying point on the Missouri Pacific system in Arkansas? A. It could be true. However, as I say, these maintainers travel, and they check radios at McGehee, Monroe, Louisiana, and various places on the Southern District, and it is done by other than radio maintainers at some points. These men that I am speaking of are radio maintainers, with that duty alone.

Q. They are people that maintain your radios? A: That is correct.

Q. Maintenance people? A. That is what they have them for, yes.

Q. Mr. Sheppard, in regard to Plaintiffs' Exhibits 1 to 17, which was the report of a survey made in the summer of 1966. I believe you stated that you received your instructions to have the survey conducted and completed in a hurry. Was that your statement? [243] A. As I recall, the way I received the instructions was over the telephone from Personnel Department in St. Louis, and they told me that they were sending some forms in the mail and they would like to get the forms completed, survey made, and get the forms returned as quickly as possible. They had, I don't remember what the time limit was, but rather short.

Q. And was the survey completed within the time limits set? A. I am sure it was. When I received the forms I gave them to the superintendents and told them to get their officers lined up, make the survey and complete the forms and send them back in. I never did have any further handling of the forms personally.

Q. How did you come to the conclusions that the runs ridden for purposes of the survey or study were representative of the operations of the Missouri Pacific Railroad Company? A. Well, that was the instructions that we had, and that was the instructions that I passed on, that they wanted a good cross-section or to show a representative of Missouri Pacific operations.

Q. And you thought because these were the instructions that you received, and this then was the result of the survey, that it was a good representative cross-section of the Missouri Pacific operations. Is that correct? [244] A. Well, I naturally assumed that since that was the instructions that I issued that that is the way it would be done.

Mr. Ross: Your Honor, the Court has reserved its ruling on Intervenors' objections to Plaintiffs' Exhibit 98, which is a part of the record of the 1907 full-crew case, and Plaintiffs' Exhibit 99, which is a part of the Attorney General's brief in the Norwood case. Since the Court has reserved its objection, or its ruling, may I proceed to cross-examine Mr. Sheppard in regard to the statements elicited from him in regard to these two documents?

Judge Van Oosterhout: Without waiving your objections?

Mr. Ross: Without waiving our objections.

Judge Van Oosterhout: That will be entirely satisfactory. I think that will be fair.

Q. You testified as to the weight of chains used to tie a car with a pull draw bar to the head end of the train for purposes of setting it out. You contrasted that weight to a flexible cable, weight of the flexible cable used. Now, the draw bar or draw head weight or weighs as much now as it did back then, doesn't it? Maybe even more. A. I don't know what they weighed during that time, but in appearance in general they are very similar. So I would assume that they weigh about the same.

Q. Do you know how much a draw bar weighs? [245] A. It depends upon the type and how much of the fixtures

were on the draw bar, but it would weigh between three and four hundred pounds in any case.

Q. And possibly more, depending on what was still attached to it? A. I don't believe with all the attachments it would be more than four hundred. It is possible that it could be. I am referring to the knuckle, the knuckle pin and the, possibly the pin lifter would still be intact.

Q. If the draw bar is pulled and becomes wedged underneath the train, it takes several men to remove it, doesn't it? A. It would depend upon how badly it was wedged. It may be possible that it would take mechanics or a wrecking crew, but two men can move a draw bar ordinarily.

Q. In the event it does become wedged under the car, it is possible that it might take three men to remove it? A. It is possible that the train would have to be moved before any number of men could move it.

Q. Is it possible that it might take four men to remove it? A. I don't think if it is wedged you could consider moving the draw bar until you moved the portion of the train that it is wedged on. Then two men could handle it.

Q. If it is wedged underneath the wheels, how are you going to move that train, Mr. Sheppard? [246] A. You will have to move it, because the train will have to be moved before you can move the draw bar. You may derail a wheel if you move it, but I know of no situation that wouldn't require the train to be moved if it was wedged under the wheel. That particular car would have to be moved.

Q. You don't think it might be possible to get the draw bar out without removing the car? A. Not if it is wedged under the wheel, no, sir.

Q. What if it is wedged under the train; not under the wheel? A. Depends upon the condition. I will say that I have never seen one wedge so badly that two men couldn't roll it and get it out from between the rails.

Q. A four hundred pound draw bar? A. Yes, sir. The construction of a draw bar is such that they roll fairly easy.

Q. Mr. Sheppard, you mentioned certain standards set by the Association of American Railroads as to various equipment used by the railroad. Is the AAR a federal regulatory agency? A. No, sir, it is not.

Q. Is it a state regulatory agency? A. No, sir.

[247] Q. Then these standards which the AAR sets are not laws of any governmental body? A. As far as I know, they are not.

Q. In contrasting some of the activities of the crew in 1930 and the present day crew you mentioned cars with wooden car doors falling off in the 1930's, and that you don't have wooden car doors falling off at the present time. The crew is still required to watch the train, observe the train at every available opportunity, to look for hotboxes, open doors on any of the cars, shifting loads, dragging equipment, sticking brakes, cars off-center and other conditions that effect the movement of a train, would they not? A. They are required to observe the train for any conditions. That is correct. But I don't believe I testified that there were no more wooden car doors. There are not many, and they do occasionally fall off. I believe that was my testimony.

* * * *

Q. Mr. Sheppard, is there some of the equipment pulled in trains by the Missouri Pacific still equipped with a staff or steam-winder type hand brake? [248] A. It may be possible to find one. I haven't seen one in a number of years pulled by Missouri Pacific trains.

Q. Have you seen any UTLX tank cars recently? A. Yes, sir, I have.

Q. Did you notice the type of brakes on those cars? A. Most of the modern tank cars have a staff brake, with a short staff, on the platform, and it is equipped with

gears. It is a power-type brake. It is possible there are some of the old stem-winders where the chain winds around the stem.

Q. Mr. Sheppard, are the new type brake beams with the metal bar underneath that you referred to yesterday, is that the unit type brake beam? A. I believe that is what is referred to as the unit type. Mr. Meinholtz' testimony covers that thoroughly.

Q. You were testifying yesterday concerning brake beams yesterday. I thought you would have this information. Do you know what percentage of Missouri Pacific rolling stock has the unit type brake beam? A. No, sir, I don't know what percentage.

Q. Would you know what percentage any of the other plaintiff railroads, do you know what percentage of equipment any of the other plaintiff railroads might have equipped with unit type brake beams? [249] A. No, sir, I would not know.

Q. Mr. Sheppard, when you pull the pin to uncouple cars the knuckle on one of those cars opens. Is that right? A. Yes, sir, on the car on which the pin is pulled.

Q. And when you are trying to couple up to cars with the knuckle closed it is necessary for someone to pull the pin and open those knuckles? A. If both knuckles are closed it is. However, it is not necessary that one knuckle be open to make a coupling.

Q. If both knuckles are closed, and I suppose that sometimes happens, doesn't it? A. It is possible.

Q. Someone has to pull the pin on one of those knuckles, and don't they usually have to take hold of the knuckle and pull it out by hand? A. No, sir, they do on occasion, but by lifting the pin lifter the knuckle in many cases will open. In many cases it is necessary to take your hand and open it.

Q. There is a better chance the cars will couple with both knuckles open, if the knuckles are open on both cars

being coupled. Is that correct? A. No, sir, that isn't entirely correct. There is a better chance that the knuckles will not have to be adjusted if they are both open, but it is not necessary to have but [250] one knuckle open to make the coupling if they are adjusted properly.

Q. I realize that it is not necessary, Mr. Sheppard, but you have a better chance of the cars coupling automatically, as you call it, if both knuckles are open, don't you? A. I wouldn't say that you would. I just can't see how that would help.

Q. Are there any problems in coupling presented by the long TTX cars and the cars with the cushion underframe? A. If on curved tracks that could present a problem.

Q. Mr. Sheppard, you referred to a portion of your railroad which is covered by or equipped with centralized traffic controls, also being equipped with remote control switches. These are usually referred to as dual control switches, are they not? A. Most of our so-called remote control switches are in fact dual control, even though they are referred to as remote control.

Q. This means they may be operated by hand also? A. That is correct. They may be operated remotely or by hand if for some reason it is necessary or preferable.

Q. You referred to the siding between Little Rock and Alexandria, Louisiana, as having a control switch at one end and a spring switch at the other. What is a spring switch? [251] A. A spring switch is a switch constructed with a spring mechanism which may be run through in trailing point direction without the necessity of throwing the switch. It will—the point will open by compressing the spring, and after the movement is completed the point will return to normal position. It is not necessary to line the switch to go through it or after you have been through it.

Q. All right, when you have a remote switch on one end of a siding and a spring switch on the other, this allows movement through the spring switch from the siding to

the main track without a crew member throwing that spring switch. Is that correct? A. Yes, sir, that is correct.

Q. How about movement in the opposite direction, a train moving in the opposite direction, what would it have to do in order to occupy that siding? A. If necessary to head that train in the siding it would be necessary for a crew member to operate the switch by hand, let the train enter the siding. But they are constructed in such a manner that the intent is to have the train enter the siding that approaches from the end with the remote control switch. It is possible it could happen you would want to put the other train in the siding.

Q. One of the exhibits—referring you to the 1907 or the 1930 case refers to a condition of the hold yard at North Little [252] Rock I believe it was to the effect that there was debris all over the track. And I believe you testified yesterday that had now been cleaned up. Is that correct? A. Most of the hold yard, most of the tracks have been retired and that yard is being used for the welded rail facilities.

Q. Is there another area in North Little Rock referred to as a hold yard, or a little hold yard? A. Well, yes, there is one referred to as the little hold, but I believe the question that I answered was in connection with the other one, which I have always considered as the hold yard.

Q. Yes, sir. I believe you were asked about a hold yard in North Little Rock. A. Yes, sir.

Q. There are two such locations? Is that correct? A. I have heard reference made to a little hold yard.

Q. Do you know what type industries or businesses are located in the little hold? A. I am not sure that I know just what the area they are referring to as the little hold.

Q. Do you know where the North Little Rock Tin Compress is located? A. Approximately, yes.

Q. Is that in the little hold? A. Well, I couldn't say for sure, but I would assume that it is.

[253] Are there any junk yards in the little hold? A. There are junk yards in that area.

Q. They put junk and debris close to the track. Or do you know? A. I don't know. I haven't actually looked at those tracks in some time.

Q. Mr. Sheppard, how wide are the newer track cars, train cars? A. The newer what type cars?

Q. Freight train cars? A. They would vary. I don't think there is any standard width.

Q. What is the widest freight train car that your railroad would operate in Arkansas? A. I couldn't answer that. I don't get the specifications on all of the cars, and I just don't know exactly.

Q. As superintendent. Pardon me.—As general manager of the Southern District, would you be concerned with the clearances available on your track in Arkansas? A. Yes, sir.

Q. What is the minimum clearance required by the Arkansas law, or by an Arkansas regulatory agency? A. Do you mean structures?

Q. Minimum track clearance on structures? A. Under the present regulations I believe it is eight and one-half feet from the center line on new structures.

[254] Q. Mr. Sheppard, could that be five feet nine inches from the center of the track on one side, and eight feet from the center of the track on the other side? A. It could be, yes, sir.

Q. Are some of the newer cars as wide as eight to ten feet? A. Some of them are eight feet.

Q. Mr. Sheppard, yesterday you referred to accidents, cost of accidents, damage to equipment. Do you ever recover any of the costs of these accidents or damages to equipment? A. We, in some cases, recover a portion of the cost, but it is very rare that we recover anything.

Q. You mentioned one in particular, or Mr. Light perhaps mentioned one in particular yesterday at Norphlett,

Arkansas, in which a train collided with an oil tank truck at a crossing. A. Yes, sir.

Q. Do you recall that? A. Yes, sir.

Q. Did you recover your damages in that particular case? A. We didn't recover half of our damages: We recovered some, but we had much more damage than we recovered. As I recall, we didn't recover but about half of the damages. That was a rare case, I might mention.

* * * *

[255] Q. Do you recall the amount that you did recover in that particular case? A. I am not positive, but I believe it was a little over $50,000.

Q. You referred yesterday to the cost of delays to your railroad in meeting schedules. In accordance with the policy of your schedule completion, are employees urged to conduct their duties in an expeditious manner as possible? A. They are urged to conduct their duties safely above everything, and certainly on our red ball schedules, our more competitive trains, we have eliminated every delay possible to the extent of operating the cabooses and engines all the way from Dupo, Illinois, to Texarkana, and stopping for nothing but to change crews at crew change points.

Q. But you urge your crews to perform their duties in as expeditious a manner as possible, don't you? A. Certain duties, yes, sir.

Q. Would fewer brakemen on occasion extend the time for some particular switching operation? A. It is possible that it could.

Q. Would the absence of a fireman at times perhaps extend the time for switching, taken up for switching operations? A. It could be possible.

Q. Could the absence of a brakeman or fireman at times [256] contribute to delay of the train? A. It would depend upon the circumstances, and I don't think there would be

any case where a four-man crew couldn't perform the duties safely and satisfactory.

Q. I don't believe that was my question, Mr. Sheppard. A. I beg your pardon.

Q. Would there be any time that the fireman or that the absence of the fireman might contribute to the delay of the train? A. It is possible.

Q. Are there occasions on which a train crew might try to switch longer strings of cars than reasonable safety permits in order to comply with the particular schedules? A. No, sir, I wouldn't think that they would try to switch a longer string of cars than they could switch safely.

Q. Mr. Sheppard, is this the Uniform Code of Operating Rules that governs the employees of your railroad? A. Yes, sir, it is.

Q. Would that book in Timetable Number 4 for the Southern District for the Missouri Pacific Railroad Company include all (Strike)—Do you also have some instructions for your employees in your Timetable? A. Yes, sir, we do.

Q. Is this your current timetable? [257] A. Yes, sir.

Mr. Ross: I would like to introduce these into evidence as Intervenors' Exhibit 36, Uniform Code of Operating Rules. And Timetable Number 4, Southern District, Missouri Pacific Railroad Company as Intervenors' Exhibit 37.

* * * *

Q. Mr. Sheppard, how familiar are you with the equipment and the operating conditions of the other plaintiff railroads in this case? A. Fairly familiar, in a general way, with part of them. In fact, we operate joint track with two of the railroads.

Q. Which two? A. The Cotton Belt and the Rock Island.

Q. For which distance do you operate joint tracks with the Rock Island? [258] A. From Malvern to Hot Springs.

Q. For what distance with the Cotton Belt? A. From Yomo, Missouri, to Dexter, Missouri.

Q. That is not in the State of Arkansas? A. Not in Arkansas, no, sir. However, the same equipment continues on through Arkansas.

Q. The same rolling equipment? A. Yes, sir.

Q. How familiar are you with the stationary equipment —that is, the track, roadbeds, the centralized traffic, control or lack of, the weight of the rails, this sort of things of these other railroads? A. I am not familiar with too much of the details. I have examined some of their rail and signal appliances and their rolling stock, and it compares pretty well with the Missouri Pacific.

Q. Does it compare in the extent to which they have made improvements or obtained such equipment? A. I don't know. I don't have the statistics on their improvements. All I know is what I have seen in making observations.

Q. You were talking about cattle cars yesterday, Mr. Sheppard. Do you know whether or not the other railroad, the other plaintiff railroads in Arkansas pull any stock cars? A. No, none of the railroads in Arkansas pull very many loaded [259] with stock. We use some now to load wood products, such as handle blanks, cross ties, company material. There is not much demand for stock cars.

Q. Do you know how many stock cars moved over the line of the Cotton Belt Railroad in Arkansas for 1966? A. No, sir, I do not.

Q. Do you know how many stock cars moved the rails of the St. Louis-San Francisco Railway in Arkansas for 1966? A. No, sir.

Q. You are not really familiar with the operations of these other railroads, are you, Mr. Sheppard? A. Well, as I said, in a general sort of way. I doubt that anybody would be able to give you figures on the number of stock cars that have moved over any of the railroads in 1966.

Q. I doubt that either, Mr. Sheppard. But that was one of the categories mentioned by you yesterday——

* * * *

[260] **Further Cross-Examination,**

By Mr. Lessenberry:

Q. Mr. Sheppard, I believe that you commented during your direct examinat n that frequently the trains are blocked to the destination? Is that correct? A. Yes, sir, that is correct.

Q. This is not entirely or totally complete in this blocking system, is it? A. In some cases, it is not, no, sir.

Q. As a matter of fact, there is an ICC regulation or other safety regulations which requires the isolation of explosive materials in the train? A. That is correct.

Q. And regardless of the destination of the carload of explosives material, it would have to be isolated so many [261] cars from the rear, so many from the front of the train? A. Yes, sir.

Q. I believe you mentioned your railroad at least doesn't carry livestock as it did back in the 30's, that is, the amount that it use to carry. A. That is correct.

Q. Has there not been substantial change in the type of materials that the railroad does transport now as opposed to thirty years ago? A. Yes, sir, there are many new commodities that we did not have in 1930.

Q. Primarily, I guess the petroleum products would fall in that category, would it not? A. Less petroleum products than we handled in the 30's.

Q. Is this because of pipe lines and other types of transportation? A. I suppose that is true.

Q. I believe there was a pretty destructive accident occurred near Traskwood, Arkansas. Is that along the Missouri Pacific lines south of Little Rock, a few years ago? A. Traskwood is, yes, sir, and——

Q. Do you recall that event? A. I recall hearing about it. I was on another district at the time.

Q. Isn't it a matter of fact, Mr. Sheppard, that now the Missouri Pacific is carrying more volative or dangerous types of material currently than it did thirty years ago? [262] A. I believe that would be true, yes, sir.

Q. In fact, there is a switch in service at Monsanto at El Dorado, if I am not mistaken, that makes different types of chemical fertilizers and things of this nature. A. That is correct.

Q. And if I am not mistaken the Arkansas-Louisiana Gas has just opened another of this type of plant over at Helena. Do you not service that plant also? A. Yes, sir, we do.

Q. This is just in the past few weeks? A. Just this past week, I believe, they went into production.

Q. Is there any requirement, or does your railroad have any rules as to the separation of this type of cargo as opposed to those cargoes defined as explosives? A. The ICC regulates the commodities.

Q. Several times during your testimony, Mr. Sheppard, I believe that you stated that in your opinion a crew of four persons could safely operate trains on the railroads with which you are familiar. A. That is correct.

Q. Would you, for my benefit, tell me how you personally would make up this crew? A. Do I understand you correctly that you want me to tell you what the crew would consist of?

Q. Well, you would have an engineer, yes. [263] A. An engineer, conductor, and two other men. They could be brakemen or a combination brakeman-fireman.

Q. The duties under your concept might necessarily differ from what the duties of say a brakeman are defined as today, or fireman are defined today. Is that correct? A. I don't believe I understand your question.

Q. Well, would you have one person in this crew of proposed four people conducting just the duties of a fire-

man as he performs during this period currently? A. No, sir, my idea would be to have an engineer, conductor, and two brakemen—one of the brakemen to ride where the fireman has ridden in the past, if necessary.

Q. Then you would carry two persons in the cab of the locomotive, or the head unit? A. Possibly, at times.

Q. And during switching operations would you have two people also in the engine, or the head unit, or the one switch engine? A. Not necessarily all the time.

Q. What I am getting around to, Mr. Sheppard, I am just curious to know and you first if you do agree that in some of your switching operations conducted by your railroad that it is necessary or beneficial at least to give signals from the fireman's side? A. That could be beneficial at times. However, it can be done from the engineer's side.

[264] Q. There is an abundance of testimony in the record thus far but you would give me the qualified answer of yes because of curvature of the track or the extension of buildings or other obstructions, foliage and so forth, it is beneficial to give signals from the fireman's side. A. If you have an employee on the fireman's side, yes, sir.

Q. This depends to some extent on the length of cars you are switching, or I mean the number of cars you are switching, or the distances the engineer or fireman can see ahead, and things of this nature. Isn't this correct, sir? A. The length of the cut of cars being handled would have some bearing on it, yes.

Q. And, of course, the additional persons on the crew in these switching operations that is now operated under a full crew gives you a more speedy or more expeditious switching than your proposed crew would give. A. In some cases it does. In other case, there is nothing for the additional crew members to do.

Q. You talked about impairment of capital, as to the passenger trains. The Missouri Pacific still does operate some passenger trains, does it not? A. Yes, sir, it does.

Q. Is it not correct to state there is a state statute regulating the minimum crew on a passenger train? [265] A. Yes, sir, that is correct.

Q. The amount of freight carried on your railroad will vary from time to time, will it not, Mr. Sheppard? A. Yes, sir, it varies.

Q. And Arkansas being largely an agricultural state, I suppose you have harvest time when you have to put on additional cars and perhaps even additional trains. A. Yes, sir, in the fall season we run additional trains and operate additional yard engines.

Q. Mr. Sheppard, under your plan of four crew members, can you envision a circumstance where you might want to add additional crewmen onto your original four-man crew? A. I can't think of any conditions under which we would need more than four crew members.

Q. Would weather ever prompt you as a person in managerial capacity with the railroad to add additional crewmen other than the four that you mentioned? A. I don't know of any way that it would, no, sir.

Q. This crew size that you suggest would not be elastic in any degree? A. To the extent that no more than four men are needed to operate a train or an engine.

Q. You made reference to a photograph that was introduced in evidence, Mr. Sheppard, that had constructed on the [266] tinder a so-called doghouse as you referred to it. Does all of your steam locomotives or tinders to those locomotives have doghouses of this nature? A. No, sir, they did not.

Q. Very few of them did, did they not? A. There was one period that there were a very few, and then they were increased. And it varied. There is never a time that they all were equipped with the doghouses.

Q. Where did the brakeman ride when there was no doghouse for him on top of the tinder? A. Many cases there was a small jump seat ahead of the fireman, and if two of the brakemen were on the head end one of them

rode there and the other one in many cases was able to talk the engineer into moving forward a little bit on his seat which was a little bit larger, and he sat down behind the engineer.

Q. Did this afford this brakeman in either of those circumstances you described to the Court a better view forward? A. He couldn't get his head out the window at all. He had to depend upon, in the case of the brakeman behind the engineer, he had to look forward through a small window and around the engineer. In case of the brakeman sitting ahead of the fireman, the closed portion of the window [267] was opposite this brakeman, and I believe his only view was ahead through the small window in front of the cab.

Q. How about the view to the rear of the train, particularly on curves. Would the positions you described permit those brakemen to view the train and inspect it to the rear on curves? A. It is possible the brakeman sitting behind the engineer could look back on that side of the train, but it would be rather difficult.

Q. Actually, as I understand your testimony, Mr. Sheppard, the head brakeman, the one riding the leading unit of the motive power today on a railroad train has a lot better view forward and to the rear than those who passed with steam locomotives. A. It depends upon where he is positioned.

Q. I understand that. A. He rides the lead unit but he may ride in the, on the brakeman's seat or he may look out the window, he may stand up, he may go from side to side. There is no certain place that he would ride on the unit.

Q. Does the rules of your railroad, not withstanding that you might have radios in the caboose, that they would also maintain regular signal lights and things of this nature there? [268] A. Yes, sir.

Q. You mentioned some track cleaning equipment and particularly a track cleaning car in North Little Rock.

Does this car travel all the yards in Arkansas of the Missouri Pacific? A. We have more than one. I don't know just how many, but we have two that are used on the Southern District, and they do travel and clean yards as they can get to them.

Q. Have you made any personal or independent study of accidents or injuries that might occur to trainmen in regard to train service? A. Are you referring to individual accidents?

Q. Yes, and accidents as a whole. A. Yes. I get reports on accidents, and if there is anything that is not clear in the report I usually handle with the superintendent to investigate thoroughly.

Q. Haven't you found from your—were you through? A. And advise what happened.

Q. I am sorry that I interrupted you.—Have you satisfied yourself through a study of these reports that frequently these accidents or injuries occur because of fatigue to the crew? A. I don't recall a single one that could be attributed to that.

Q. I believe in your direct testimony you said that in your opinion that you felt like that one flagman at a public [269] grade crossing was adequate. Is that true? Did I understand you. A. That is correct.

Q. Did you suggest that perhaps two flagmen, one on either side of the track, might constitute a hazard to the trainmen out there? A. Yes, sir, I did.

Q. Would you explain that to me further. A. We have had flagmen injured protecting crossing and it is necessary that we protect them, and we insist on them being protected. But one man is sufficient to do the job, and if you have two of them out there, one of them could distract the attention of the motorist and cause him to hit the second flagman.

Q. That is just a speculation on your part? A. I never saw it actually happen that way, but I have flagged lots of crossings, and I know what takes place.

Q. Mr. Sheppard, isn't it true that notwithstanding flashing signals and bells and flagmen that you often experience a very difficult task of slowing or stopping motor vehicle motorists, persons in motor vehicles? A. That is true. They, in some cases, will not stop.

Q. Are you familiar with the radio equipment that the other railroads maintains? A. No, I am not familiar with it.

[270] Q. As a general rule, Mr. Sheppard, isn't it true that the Missouri Pacific Railroad by and large have better safety equipment, better rolling stock, better maintained motive power than the other railroads operating in Arkansas? A. I don't believe I could agree with you that that is true. Missouri Pacific does maintain a good railroad and well maintains its rolling stock, but I am sure that the other carriers do the same. We interchange with the other railroads and they have to maintain their rolling stock, or they will not be accepted through interchange.

Q. This is interchanged through your AAR? Minimum standards, is it not? A. The AAR has certain standards that must be met, but the ICC also polices the interchange of equipment.

Q. As to—— A. Safety appliances.

Q. You wouldn't agree with the proposition that Missouri Pacific is perhaps the safest railroad operating in Arkansas? A. Well, I don't think I am qualified to say that it is the safest. I think probably the records would have to be searched to give a good answer to that.

Q. You made reference, Mr. Sheppard, to some disciplinary action that was taken against some operating employees. As I understand your testimony, that this was disciplinary action taken for the failure of those employees to discharge [271] their assigned duties and tasks. A. That is correct.

Q. You don't have anybody on these trains not governed by particular rules and regulations of the railroad

industry as to what particular functions that they are to perform while they are on the train? A. Our operating rules do not spell out the duty that will be performed by each crew member. They have certain requirements that must be met by all of the operating crewmen.

Q. During the movie I guess we saw all of the switch engine being operated, and somebody made the comment that a fireman was operating it and the engineer was looking out the window. Is this permissible under the rules of your railroad for a fireman to operate the locomotive? A. Under certain conditions, yes, sir.

Q. He is in fact trained for the purpose of relieving the engineer under certain conditions? A. Well, it is permissible for the fireman to operate the engine under the supervision of the engineer.

Q. Well, the fireman is there also to relieve the engineer if the engineer becomes incapacitated, is he not? A. Any crew member can do that if the engineer becomes incapacitated, if he is qualified.

Q. Well, and the fireman is the one that is qualified, is he, Mr. Sheppard? [272] A. Not necessarily. Fireman might not be any better or as well qualified as one of the brakemen or the conductor.

Q. You are talking about a fireman that hasn't fully completed his training course, or hasn't been on the road a particular length of time? A. That is mainly what I had in mind, yes, sir.

Q. You are talking about the exceptions rather than the rule for the purposes of the fireman being there, aren't you? A. I wouldn't say it is the exception. I know we hire new employees, both firemen and brakemen practically every year, and these young fellows make a few student trips and go to work and full a position on the crew with no experience, you might say.

Q. They don't have tests, and things of this nature? A. We give them a rule book and we try to teach them all we can about the rules, and we do give them an ex-

amination on the operating rules in order that they can take care of themselves and not be a hazard to the other crew members. But as far as any extensive instruction on the operation of the train or the diesel, they don't get it before they go to work.

Q. Mr. Ross asked you about the dimensions on some of your newer freight cars, rolling stock that your railroads receive. I believe that you said eight feet was as wide as you recall. Were you referring to the outside dimensions [273] or the inside storage dimensions? A. I don't——

Q. You don't really know? A. I don't really know what the widest car is that we operate.

Q. With regard to these spring operated, spring loaded switches, occasionally at least do these spring switches become fouled, with rocks and other debris, so that they won't fully close? A. It has happened, yes, sir.

Q. Does that circumstance require trainman or a member of the train crew to come down and remove the obstacle? A. If making a facing point movement, the crew would get a stop signal of the, or stop indication of the block signal that would require that a crew member operate the switch by hand.

Q. I believe yesterday during the direct testimony Mr. Light made reference to your block signals, or your block system being divided into blocks of anywhere from one and a half to three miles in length. Is this in essence your testimony? A. I believe that is correct.

Q. As a matter of fact, don't you have some blocks that are say, fifteen to seventeen miles long? A. Well, ordinarily they are from one and a half to three miles, but there is no limit to the length of a block [274], and there are blocks that are longer than three miles.

Q. You have what I understand a railroad personnel term as dark railroads? A. Yes, sir, we do.

Q. That is, railroad without either ABS or CTC? A. Right.

Q. Mr. Sheppard, are you familiar or did you ever have any personal experience with an engineer becoming incapacitated the time that you were working the railroad? A. I don't recall any specific instance where I was crew member or at the particular point. I have heard of a few cases.

Q. You received reports like that in your capacity, have you not? A. Yes, sir.

* * * *

Redirect Examination,

By Mr. Light:

Q. Mr. Sheppard, you told Mr. Lessenberry that you couldn't conceive of a set of circumstances where you would assign a crew larger than four for the purpose of safely operating trains. Can you visualize any circumstances where you would assign a crew of less than four that could, in your judgment, safely operate a train? [275] A. Yes, sir, I can.

Q. Mr. Sheppard, have you examined Exhibit 15, Plaintiffs' Exhibits 15, 16 and 17? A. Yes, sir.

Q. What do those exhibits represent? A. They represent logs that were kept by trainmasters and road foremen when they rode trains and made observations.

Q. In connection with this study last summer on Missouri Pacific? A. Yes, sir.

Q. How would you characterize the trains listed on those three exhibits with reference to whether or not they are typical of trains operated by your railroad? A. It is a good cross section representation. It doesn't cover all of the trains operated, but it has some of each kind.

Q. Mr. Sheppard, were you with Mr. Borgette when he took the film of the D K & S on the second day of filming at Kensett? A. Yes, sir, I was.

Q. What instruction did you give him with regard to where to place himself to do this job? A. Well, on the

first day we were in his automobile and he was holding the camera and filming through the windshield. [276] When we ran the film it was of a poor quality, and I discussed it with Mr. Borgette and he said only with the use of a tripod could he improve the quality of the film. So I told him to get a tripod and when he went back up there to use the tripod. He advised me that in order to do that he would have to set it up on the ground and probably be in view of anyone that happened to be looking. And I advised him that it would just have to be that way because we wanted a good quality film. So he set it up on a tripod——

Q. Were you standing with or near him during the time he operated the camera on the tripod this second day? A. Yes, sir, I was.

Q. Were you at that time known to the D K & S employees? Did they recognize you? A. I don't believe they would. We were across the street from the railroad in the immediate vicinity of the fire station, and from my observation they didn't appear to even notice us for some time——

Mr. Lessenberry: I object. It is hearsay, and speculative about what somebody could see or hear or recognize.

Judge Miller: He is just replying to yours.

Judge Van Oosterhout: Overruled.

Q. After the filming was over did you have any contact with those three employees? [277] A. Yes, sir, after the crew completed their switching the engineer got off of the engine and I walked over and spoke to him, and he said well I am glad to meet you.

Q. I won't ask you that, to relate what he said. In any event, did you meet all three of the employees? A. Yes, sir. Then I went and spoke to the other two crew members, the conductor and the brakeman.

Q. Was this the first occasion you had ever had to meet these three men? A. The first time I had ever met them

and spoken to them. I had seen them before from a distance.

* * * *

Further Recross-Examination,

By Mr. Ross:

Q. Two or three questions, Mr. Sheppard. Were the runs which were included the survey in the summer of 1966 selected by any statistical sampling method? A. As far as I know, they were not. I didn't select the runs.

Q. You turned that responsibility over to whom? A. The superintendents.

Q. Mr. Sheppard, is there any difference between the changing of the crews at the state line now as opposed to changing of those crews back in 1930? A. I can't answer that, because I don't know what they did in 1930. [278] Q. You don't know whether there is a difference in the practice where the members got on and off the train in relation to the state line now as opposed to the 1930's? A. No, sir, I do not.

Mr. Ross: I believe that is all.

Judge Van Oosterhout: Anything further from this witness?

Mr. Light: No, sir.

Judge Van Oosterhout: Very well, you may be excused.

* * * *

Mr. Youngdahl: We object to the introduction of Plaintiffs' Exhibits 103 through 108 which consist of all those documents relating to the movies and the movies themselves, and further move to strike all testimony concerning those movies for the reasons we stated at the beginning of said series.

Mr. Lessenberry: The State joins in the objection.

[279] Judge Van Oosterhout: The ruling will be reserved. The exhibits will be received, subject to the objections.

* * * *

[280] **MR. H. E. GREER,**

being called to the witness stand on the part of the Plaintiffs, after being duly sworn, testifies as follows:

Direct Examination,

By Mr. Lucente:

Q. Mr. Greer, will you state your full name. A. H. E. Greer, G-r-e-e-r.

Q. Where do you reside? A. I reside at 1756 Good Avenue, Parkridge, Illinois.

Q. What is your present employment, Mr. Greer? A. I am director of research of the National Railway Labor Conference, with offices in the Union Station in Chicago.

Q. What does the position of director of research involve? A. It involves the collection, assembling of material, data of an economic statistical basis, primarily for the presentation before emergency boards and other tribunals. In addition to that it includes a constant keeping in touch with developments among the member roads as to Section 6 notices served by them, and served by the union upon them, and the handling and giving notices, and work of that type.

Q. You referred to members of the organization. I take it you were referring to the National Railway Labor Conference? A. Yes, sir.

Q. What is the National Railway Labor Conference? A. It is an organization representing the bulk of the Class 1 line haul railroads and many of the smaller companies in dealing [281] on a national basis with the Railway Labor Unions which represents the employers of those carriers. The Conference represents about ninety-six per cent of the mileage and employees of the Class 1 line haul railroads.

Q. What is a Class 1 line haul railroad? A. It is a railroad that has a stipulated amount of annual earnings per year as designated by the Interstate Commerce Commission.

Q. Is that amount currently five million dollars? A. Yes, it is.

Q. Are all of the plaintiff railroads in this case members of the National Railway Labor Conference? A. Yes, they are.

Q. You referred to emergency boards with respect to which you sometimes present testimony and exhibits. Are emergency boards created pursuant to the Railway Labor Act provisions? A. Yes, created pursuant to Section 10 of the Railway Labor Act by the President of the United States. When there is a threatened interruption of commerce, the Mediation Board advises the President and the emergency board is created for the purpose of hearing both sides of the case and making findings.

Q. You also occasionally appear before Arbitration Boards created pursuant to the Railway Labor Act? [282] A. Yes.

Q. Now, there has been mention in this proceeding of the Presidential Railroad Commission and Arbitration Board No. 282. Did you participate in the proceedings for those agencies, Mr. Greer? A. Yes, sir, I did.

Q. On behalf of the carriers? A. Yes.

Q. What sort of information did you present to those two agencies? A. I presented statistical and economic data relating to safety of railroad operations and to application of the various work rules, pay schedules that were under consideration.

Q. Prior to the time that you assumed your present position, had you been employed in the railroad industry, Mr. Greer? A. Yes, I will complete thirty-three years of service May 1 of this year in the railroad business.

Q. Will you outline just briefly the prior positions, describing generally the duties and responsibilities thereof that you held in the industry. A. Yes, the first twelve years of my railroad experience were spent in the employment of the Illinois Central Railroad. The first two years in the general office of the Traffic [283] Department

in Chicago, and then I transferred to the Chicago & St. Louis, and then I transferred to the Operating Department and was on the staff of the general superintendents of the Northern Lines, on the staff of the Vice President of Operations, for several years I was the traveling secretary of the Vice President of Operations, then I became a transportation, assistant transportation inspector with the obligation of going up and down the railroads to determine that the superintendents and other officers were carrying out the regulations of the Operating Department. Then I was trainmaster on two operating divisions, the Louisiana Division and the Iowa Division of the Illinois Central.

Q. Were those heavily used divisions of the Illinois Central? A. Yes, sir, they were main line territories. I had the line from Jackson, Mississippi, to New Orleans on the Louisiana Division. From Chicago, Illinois to Freeport, Illinois on the Iowa Division.

Q. As trainmaster did you perform the duties and responsibilities that have been described in this record with respect to trainmasters? A. I am not familiar with what has been described, but if the description was typical, yes, I did. I had direct supervision of the train operations, the station forces on two of the operating districts.

Q. I forgot that you weren't present.—Would you continue [284] then to describe—— A. Yes. The next three years of my railroad career was spent as examiner and chief examiner in the organization which at that time represented the Western Railroads and the handling of regional and national wage and rules movements. I then spent three years as the Chief Personnel Officer of the Reading Company in Philadelphia. And then another four years as Chief of the Division of Wage Statistics in the Bureau of Railway Economics of the Association of American Railroads in Washington. I then returned to the Association of Western Railways and spent another

six years as the secretary of the Committee on Labor Relations of the Association of Western Railways. And during that period I also served as Chief Statistician for the three Regional Carriers Conference Committees which were then merged into the National Railway Labor Conference January 1, 1963, and since the inception of the Conference I have been its Director of Research.

Q. During the course of your work in the positions that you have described, Mr. Greer, have you had occasion to become familiar with the statistics reported to and published by the Interstate Commerce Commission with respect to the safety of railroad operation? A. Yes, I have. While I was in the Operating Department, and particularly while I was trainmaster on the two [285] operating divisions it was my responsibility to prepare the initial report made pursuant to the regulations of the Interstate Commerce Commission. And then in my work representing the conference committees I have testified on many occasions on statistics relating to operations. For the Presidential Railroad Commission I prepared studies and submitted them, submitted such studies to the commissions. So I have had quite a bit of experience in that field.

Q. Have you made studies and prepared an exhibit to present in this case, Mr. Greer? A. Yes, I have.

Q. I am handing you a document, Mr. Greer, which I have marked for identification as PX-109. Is that the exhibit which was prepared by you, Mr. Greer? A. Yes, sir.

Q. Mr. Greer, referring to the document I identified as PX-109, would you turn first to the portion identified as appendix, which is at the rear of your exhibit after the last yellow divider. Do you have that before you? A. Yes, sir.

Q. Would you briefly explain what the document is which you have reproduced in the appendix to your exhibit? A. Yes, as a preface to that discussion I would

like to point out that all of the safety material in the exhibit [286] is based on the reports made to the Interstate Commerce Commission by the railroads involved pursuant to these rules that are in the appendix governing the monthly report of railroad accidents. These rules, as is indicated on page 2 of the appendix, require that the carriers report accidents to the Interstate Commerce Commission. Section 2 of the Act makes it a misdemeanor to fail to make required reports.

Q. Are you referring there to what is labeled as the accident, reports of accidents which appears at page 2 of the appendix? A. Yes, that is a reproduction of the Act and then the instructions follow the reproduction of the Act. Section 3, which appears at the bottom of page 2 and the top of—bottom of the first column and the top of the second column on page 2 of the appendix gives the Interstate Commerce Commission authority to investigate accidents.

Q. I refer you at that point to page 5 of the appendix and ask you whether or not the appendix at that point describes the manner in which the Interstate Commerce Commission classifies railroad accidents for reporting purposes? A. Yes, sir, it does. There are three principal types of categories, three categories of accidents that are reportable to the Commission. The first type indicated there about the middle of the first column on page 5 of the [287] appendix, train accidents. As defined, train accidents are those arising from the operation or movement of trains, locomotives or cars, which result either in a reportable death or injury, and more than $750 damage to equipment, tracks, or roadbeds. Thus, a train accident, of necessity, has to involve more than $750 damage to railroad property to be reported as a train accident. If the damage to railroad property is less than $750, it then, the casualty or the death is then reportable as a train service accident. Now, these are technical terms which have been used by the Commission for many years, and

you have to know precisely what is intended by them. You can't tell by the title. But there may or may not be any personal injuries, any casualty or fatality involved in a train accident. The mere fact that there is property damage to railroad property of more than $750 makes it classifiable as a train accident. On the other hand, a train service accident must, by its very nature, involve a casualty to a person.

Q. Now the train service accidents to which you referred are defined, are they not, at page 5 under group Roman II following the definition of train accidents? A. Yes, sir. The principal difference between a train accident and a train service accident is the property damage element. Both types of accidents, though, must relate to the operation [288] of locomotives, trains or cars. The third type of accident, group 3, are accidents which do not result from the operation or movement of trains, locomotives or cars.

Q. With respect to the reporting requirements prescribed by the Commission, has the Commission prescribed forms that the carriers use in reporting these various kinds of accidents? A. Yes, sir, the Commission prescribes forms and they have certain classifications for them. Those are described beginning at the middle of the right-hand column on page 7. The initial reporting of either a train service or non-train accident is made on what the Commission designates as Form T. Then as a supplement to the Form T, the Commission requires that in connection with highway grade crossing accidents that a special type supplemental form be filed. And there also is a method for reporting subsequent fatalities. And finally the Commission says that all forms as is indicated on page 8 are submitted with a summary sheet which they designate as Form V. So that the reporting regulations are pretty well prescribed and described by the Commission in its instructions.

Q. Does the Form V impose a verification requirement about the railroad officer making the report? A. It does.

Q. I believe you stated that that is described at page 8, [289] page 7 of the appendix, isn't it? 125.26, verification requirement? A. The verification requirement is described at page 7, yes.

Q. With that preliminary discussion of the reporting rules and regulations, Mr. Greer, would you turn to the table appearing at page 1 of Px-109 and explain what that table shows. First, though before you do that, a preliminary matter. Most of your tables relate primarily to accident data for the period since 1961? A. Right.

Q. Is there a particular reason for that for starting the comparisons in that year, Mr. Greer? A. Yes, sir, there is. As we shall see, I will lay more stress on accidents that involve injuries to persons rather than property damage accidents. The ICC reporting regulations were changed in 1961. The definition of a reportable casualty became one at that time, on January 1, 1961, of an accident that causes physical incapacity to perform a person's normal functions or normal business for a period of twenty-four hours within the first ten days following the accident. Whereas for employees on duty the former regulation required that the person be disabled, the employee be disabled for seventy-two hours within the first ten days following the accident. So that the direct comparison going back beyond 1961 would involve the difference between [290] a three day injury and a one day injury. That is the primary reason why this data is limited to 1961.

Q. When you refer to a one day injury, you are referring, are you not, to the language the Commission uses in the appendix that you previously discussed to the effect that injuries to an employee on duty sufficient to incapacitating him from performing fully and acceptably and without extra assistance all the duties customarily included in the assignment of the employee at the

time of the injury for more than twenty-four hours in the aggregate during the ten days immediately following the accident? A. Yes, sir.

Q. And with respect to injuries to other persons, how does the Commission describe the incapacity which requires that to be reported as a casualty, Mr. Greer? A. Persons other than employees? I believe that appears in paragraph C at page 3 of the appendix. The Commission says, and I quote, "injuries to any person other than an employee on duty, if the injury is sufficient to incapacitate the insured persons from following his customary vocation or mode of life for more than twenty-four hours in the aggregate during the ten days immediately following the accident."

Q. Now, returning to the table at page 1 of your exhibit, Mr. Greer, would you please explain the data apperaing [291] on that table. A. This table and the tables that follow through page 5 relate solely to train accidents, and the casualties that result from train accidents. A train accident is indicated as an accident involving property damage of at least, or more than $750. This data covers a five year period of twelve months ending August 31 of each of the years listed, 1962 through 1966. The reason for that is that the Commission's Form M-400, the source of these statements, the last one issued at the time this material was prepared, and so far as I know, that is the last one still issued, was for the month of August, 1966. So I made five fiscal year comparisons. The columns 2 and 3 deal with train accidents in terms of numbers and percentage change. Columns 4 and 5 deal with the total casualties to all classes of persons in train accidents. And in columns 6 and 7 the casualties to persons in train accidents other then grade crossing accidents. On this table and on other tables where the term "casualty" is used, it means the total of the fatalities and injuries. Where they are separated, they are separated into the two groups, fatalities or injuries. This is a com-

bination of the two. In column 8 I have shown the per cent of the freight and yard operations conducted without firemen on the Class 1 line haul railroad during this [292] period. Now, the accident data is for all railroads, all classes of railroads, Class 1, Class 2, switching and terminal companies and otherwise.

Q. So that we may have some idea of the relative proportion of those various segments of the industry, Mr. Greer, what percentage of the line-haul operations are conducted by Class 1 carriers? A. The line-haul operations, some ninety-five to ninety-six per cent, of the operations of the line-haul railroads of the Class 1 railroads.

Q. And what percentage of the total operations are conducted by Class 1 carriers, including terminal and line-haul operations? A. Including terminal, about ninety-seven per cent.

Q. The Class 2, Class 3 and terminal companies perform the residue of the service? A. That is correct. In discussing Column 8 I wish to point out that this deals with the extent of the operations without firemen during these periods. The Award of Arbitration 282 became effective on May 7, 1964, so that during, in 1964, the twelve months ending August 31, ten percent of the operations were conducted without firemen. In 1965 that per cent has gone up to forty-two plus, and in 1966 fifty-two point eight per cent. In those terms the differences [293] in the increases in train accidents from year to year may be measured, and also the declines in the casualties in those train accidents should be measured. And then the fourth element is the casualties other than grade crossing casualties in train accidents. Now there has been, of course, an increase from year to year in train accidents. I shall have something to say about this in connection with the following table. The bottom section of the table, and on other tables of this type, I have used an accident exposure rate of locomotive miles and have calculated the frequency rates in terms of a million

locomotive and motor train miles. The term "locomotive and motor train miles" is a technical term which involves the operation of trains and a measure in terms of train miles, and it also includes yard operations converted to locomotive miles on the basis of six miles per each yard switching hour. It also includes, the term also includes a conversion of road switching miles on the basis of six miles per each hour reported, so that you have a composite representing the entire operation of the industry here.

Q. To go back over that on which the miles were computed, to be sure that we have a clear mind. Do I understand correctly that the first component that enters into it is the number of miles between terminals that a train travels going from Terminal A to Terminal B? [294] A. Yes, sir.

Q. And that is put in at the actual mileage traveled by the train between those terminals? A. Yes, sir. If it's a hundred miles and the train traverses that distance, that is the element that goes in there.

Q. If the train stops at an intermediate point on that run from A to B and performs switchings for an hour, is there an additional mileage that is entered as train miles for that run? A. Yes. The train switching hour is converted to six miles, and that illustrates that that run of 146 miles, 140 road miles and six switching miles.

Q. In addition to the train miles arrived at in that manner, with respect to the movement between terminals, is there an additional element added to train miles to take into account yard operation performed by yard crews and road crews switching in yards? A. Yes, sir. All of the yard switching hours are converted to miles, so that if an engine works eight hours that is converted to 48 miles. If it works ten hours that is converted to sixty miles. This composite total of locomotive train miles consists of those elements.

Q. Is that the composite that you have used in arriving at a so-called casualty rate? A. Yes, sir, that is right.

[295] Q. What, in essence, does the computation of the casualty rate show? A. Both with respect to the train accident rate and the casualty rate, it shows either the level of train accidents or the level of casualty in relation to the units of transportation operated by the railroad.

Q. As measured by train miles? A. As measured by train miles.

Q. Do you have further comments about the casualty rate? I interrupted you. A. Yes, I want to emphasize that during the period that there has been this increase in the frequency of train accidents—I am now looking at the bottom block—taking over the period of 1962 to 1966, there has been an increase of 44.7% and the frequency occurrence of property damage accidents there has been at that same time a decline of 30% in the casualty rates. The frequency of the times that people were hurt in these train accidents, and if we exclude grade crossing accidents from, casualty from grade crossing accidents from this calculation, the decline is about 37.8%. Now between 1964 and 1966, primarily the period just before and advent of the effect of the Award of 282 permitting the elimination of firemen in freight and yard services, to 1966 there was a decline of 18% in total casualties per million locomotive miles, and 27% in casualties to [296] persons in other than grade crossing accidents over this two year period.

Q. Do I understand the period covered by that 18% completely, Mr. Green. That is from August of 1964 to August— A. It is the period ending August 31, 1964, to the period ending August 31, 1966.

Q. So that would include then, would it not, all of the operative months of the Award of Arbitration Board 282 except August, July, June and part of May. Is that right? A. Yes.

Judge Henley: I would like to interrupt a moment. I am not sure that I understand these figures. Looking at the upper part of page 1, column 4 and column 5 in the year 1965 it seems that there were 1143 casualties in train accidents. In 1966 there were 1157?

A. Yes, sir.

Judge Henley: Going now to Column 5 this shows that there is a percentage negative, percentage change over the preceding period of 1.2 which would seem to me to indicate that there should have been fewer accidents in 1966 than 1965. Column 4, however, shows an increase. Would you explain this to me. I don't understand how the figures are made?

A. That is easy to explain. That is a typographical error. That should have been a plus 1.2 in 1966.

[297] Judge Henley: Thank you.

A. In terms of the actual number of accidents and as indicated in terms of the frequency rate, there was no change whatever between 1965 and 1966, because of the increased number of operations in 1965.

Q. The frequency rate appears in the lower half of the page? A. That should be corrected. Thank you, sir.

* * * *

A. I think that it will be clear from the material on page 2, which again deals only with train accidents, that there is little or no relation, in fact, as we go through this exhibit we will, I have reached the conclusion that there is no relationship between the variations in the frequency of train accidents and the size of these freight and yard crews on the American railroads in terms of the absence of the firemen. For example, this table is set up in terms of accident frequency per billion gross ton miles.

Q. This is strictly in terms of train accidents? A. Yes.

Q. You don't have any casualty figures on there? A. No, sir, no casualty figures. This is just a frequency of the accidents occurring. Now, for example, if we take

[298] in column 6 on the first line captioned 1st quarter we see that there was no change whatever between the 1965 and 1966, although at that time the frequency of yard and road operations increased from 39% to almost 60%.

Q. Without firemen? A. Yes, sir.

Q. You are referring now, are you, to the 3.63 appearing in column 6 and the 3.63 appearing in column 7? A. Yes, sir. Now, let's look again at the third line and the frequency rates appearing on the left-hand side for the first half of each of these years are shown. Now there was an increase of between 1965 of from 3.25 to 3.45 as shown in columns 6 and 7, or an increase of 6.2%. But that all occurred in the second quarter, and there was absolutely no change in the first quarter. Again looking at the yearly figure, and I am looking at the bottom line now, and I pointing out that the increase between 1962 and 1963 was 7.3% which was higher than the increase between 1964 and practically the same as the increase between 1964 and 1965, although, of course, the effect of the Award of Arbitration Board 282 had no effect whatever on the operations in the year 1963, and only a minor effect in the operations in the year 1964. In terms of variations from quarter to quarter and from year to year, this table does show an upward trend in [299] the number of train accidents. The preceding table shows a declining trend in the number of casualties in those train accidents. The train accidents are increasing and have been increasing over a period of time before and subsequent to the effect of Arbitration Award 282.

Q. On that subject, Mr. Greer, of changes in the number of train accidents or in the frequency of the property damage incidents reported as train accidents. Have you accumulated certain data which shows factors responsible in part at least for the increase in the number of train accidents at the same time that there has been a decline in

the rate of casualties to employees and other persons? A. Yes, sir. This material indicates that at least a part has been caused by factors which are unrelated to the absence of firemen, or in many situations unrelated to the actual level of train accidents frequency itself. It will become apparent from the discussion of the statistical material on 3, 4 and 5. Each of these three tables deal with factors that tend to produce an increase in the number and rate of reportable train accidents, without any actual worsening of the relative safety of the railroad. I want to emphasize again that we are talking about accidents which may or may not involve casualties, but are accidents which do result in property damage to railroad property. It is because of the fact of these accidents are directly [300] related, the reportability of these accidents are directly related to the amount of physical property damage in dollar terms that because of changing traffic patterns and because of the other factors, the number and rate of reportable train accidents may increase without any increase in the actual number of accidents.

Q. This $750 figure that requires a report of a collision, derailment or other accidents, has it remained constant over a period of years? A. It has remained constant since 1957, January 1, 1957. At that time it was established at its current level, and it has not changed since that time.

Q. And does the table at page 3 of your exhibit show the trend of straight time hourly rates of pay for railroad employees who repair and service the equipment damaged in such train accidents? A. Yes, it shows in the top block that since 1961, the period covered by these accidents, the figures that are on these tables on this section, the wage rates in terms of straight time hourly rate for maintenance of way employees has gone up 17.2%, and for maintenance of equipment employees 15%.

Q. Does the nature of the equipment and changes in the

consist of the car and locomotive fleet have some effect on the trend in train accidents that you have described? [301] A. Yes, sir.

Q. Would you please explain the relationship of the data on page 3 to that conclusion? A. Since World War II and particularly in the 1960's there has been a constant emphasis on upgrading of the type of equipment used on the railroads in term of boxcars, special service cars, caboose cars, and freight train cars, and, of course, there has been an upward upgrading of the power and type of diesel locomotives which are in common usage on the railroads. The data that would permit me to make composite averages for the years 1965 and 1966 has not yet been published by the Interstate Commerce Commission, but we know that this upward trend has continued. So that the data in column 10 is the latest which is available, which shows the percent increased in terms of average cost of new units, 1964 over 1961. Thus diesel units have increased by 17.9% on the average, general service boxcars by 22.1%, special service boxcars by 34.9%, caboose cars by 9.7%, and all freight train cars 23.6%.

Q. Mr. Greer, does the data table on page 4 also relate to the factors responsible in your views for an increase in train accident rates? A. Yes, in addition now to this changing value of the dollar and this inflation of costs in relation to the constant [302] figure of $750, another factor has been the changing composition of the overall railroad service. As you will note from the data on page 4, train accidents in freight and yard service are from three to four times as high as they are in passenger service. This has always been true.

Q. Have you indicated by the frequency rates which appear in columns 2, 3, 4 and 5 next to freight service and yard service designations? A. As compared with the top line, passenger service, yes. At the same time, not specifically related to the train accident frequency itself, the bot-

tom section of the table indicates that the casualty rates are also higher in freight and yard service.

Q. In connection with those two factors and the higher casualty rates in freight and yard service and the higher train accident rates in freight and yard service, does the data at page 5 of your exhibit relate to the trend in train accidents and the reasons therefor? A. Yes, the data on page 5 shows that there has been this changing traffic pattern. For example, in using only one of the several illustrations shown on page 5, using the gross ton mile measure which appears as the second figure in each of the three groups, and looking at column 10 we [303] see that between 1961 and 1965 the passenger gross ton miles on the Class 1 railroads declined by 17%, and in the middle group of figures we see that during this same period the freight gross ton miles increased by 17%, and we see that the total gross ton miles in the third column increased, in the third group of figures increased by 13.9% and at the same time there was an increase of 4½% in yard locomotive miles. Now in addition to the effect of increased costs of labor, materials and supplies, and in addition to the fact that on the American railroad there has been introduced a number of new and specialized types of equipment which cost a great deal more than the ordinary boxcar, and in addition to these two factors, the increases in levels of traffic of the magnitude shown in this table has historically resulted in and of themselves in an increase in the frequency of train accidents on the American railroads.

Q. With respect to that precisely, Mr. Greer, what was the accident experience of the railroads, for example, during the periods of the great depression from 1930 to 1935? A. The general trend was downward during that period.

Q. Very substantially? A. Very substantial amount, yes.

Q. And what was the accident experience of the railroads during [304] the period of World War II? A.

There was a tremendous, relatively tremendous increase in the frequency of accidents during that period.

Q. And also of railroad traffic? A. Yes.

Q. And your table at page 5 shows the increase over the period since 1962 in freight miles and the relative decline in passenger miles? A. Yes, sir, it does.

* * * *

By Mr. Lucente: Q. Starting at page 6 of your exhibit, Mr. Greer, you have data dealing with casualties as distinguished from accidents? A. Yes, sir. And I would like to point out before we begin the discussion of that series of tables between pages 6 and 10, which deals with casualties, that for the reasons that I have already discussed, I consider that the casualty data provides us with a much more reliable and significant measure of railroad safety without the distorting elements [305] which I have discussed in connection with train accidents. Now, it certainly is true that the money losses represented by property and equipment damage are a very serious concern to railroad management. It is also true that the personal safety of individuals obviously is a much more relevant measure of railroad safety.

Q. Turning to the table on page 6, what does the term casualties to persons of all classes include, Mr. Greer? A. This includes casualties to employees on duty, employees that are off duty, it includes casualties to trespassers, it includes casualties to passengers on trains, casualties to persons hurt in grade crossing accidents. All of these data, however, are confined to train and train service accidents, that is, accidents which involve the operation of locomotives, trains, of cars, and none of the data includes the third category of accidents under the Commission reporting regulations, that is, non-train accidents.

Q. You do show some non-train accidents in columns 4 and 5, do you not? A. Yes, as a matter of information, but the principal emphasis is, as I indicated, on train and

train service accidents. However, on this particular table the entire gambit of all three groups as shown, the first columns, columns 2 and 3 deal with the train and train service casualties, the fourth and fifth columns with non-train accidents, and finally [306] the total casualties, the sum of the train and train service plus the non-train accidents. Again, in the last column I have shown the per cent of the freight and yard operations without firemen.

Q. This data that you have shown at columns 2 and 3, and in the table generally, is for annual twelve months period, is it not, Mr. Greer? A. This table is in terms of annual twelve months periods with the first eight months of 1966 the latest period for which the data in final form is published are shown on the bottom lines.

Q. What does column 3 show with respect to casualty, changes in casualties in train and train service accidents for the two years in which operations, or the one year and eight months period in which the operations without firemen were 47.6% and 53.7% of freight and yard operations? A. In column 3 we see that there was a decline of 4½% in the casualties in train and train service accidents between 1964 and 1965, and on the last line that there was a decline of .2 of one per cent in the casualties occurring in the first eight months of 1966 compared with the first eight months of 1965.

Q. Is a comparable trend shown for a change in total casualties over those two years? [307] A. Yes, a decline of 6.2% between 1964 and 1965, and 1.6% the first eight months of 1966 over the corresponding period of 1965.

Q. At page 7 of the exhibit, Mr. Greer, you have casualty data for employees on duty. Would you please explain the concepts involved there for employees on duty? A. Yes, this is limited to casualties involving employees that are actually on duty. The first columns, columns 2 and 3 deal with train and train service accidents, and includes all classes of employees who were injured while

they were on duty by the, as a result of the operation of trains, locomotives or cars. You will note that between 1962 and 1963 there was an increase of 3.2%, between 1963 and 1964 an increase of about the same magnitude, and then in the first full year following the effective date of Arbitration Award 282, the year 1965, when 47.6% of the freight and yard operations were conducted without firemen, there was a decline of 3.8% in casualties in train and train service accidents, and for the first eight months of 1966 a decline of 5.9%, and during this period almost 64% of the operations on the American Railroads were conducted without firemen.

Q. Does column 7 show a comparable trend for total casualties including casualties in non-train accidents? A. Yes, sir, it does.

[308] Q. You——

Judge Henley: Are there in figures in this exhibit that show the relative numbers of employees on duty in 1964, 1965 or 1966?

A. No, sir, none in this exhibit that show the relative number on duty. There has been in terms of total employment over this period a modest decline in terms of, of course, in the firemen there has been a substantial decline, in terms of yard and road trainmen, about a stand-off because of the increasing business has off-set the number of employees in train service, that is, brakemen and freight in yard service, which have been eliminated pursuant to the various special board awards made in accordance with the Award of the Arbitration Board. So that the only group of employees that shows any marked decline is that of the firemen themselves.

Judge Van Oosterhout: Were you referring to the increase in the number of trains or the increase in the number of crewmen on the train?

A. I was referring to the increase in the number of trains as offsetting the number of persons per train in terms of train service.

Q. That is indicated by the data you have in the exhibit with respect to increase in train miles? A. Yes, sir.

[309] Q. Mr. Greer, with respect to context of employees on duty injured in train and train service accidents, is that primarily the employees involved in the operation of trains? A. Primarily, but not entirely. There are, of course, employees on duty other than, in and around trains and yards which are not engineers, firemen, conductors or brakemen. There are car inspectors, there are mechanics of various types, there are yard clerks, that their regular duties require them to be in and around trains and yards movement.

Q. Do you have an approximate figure you can give us of the relative percentage of the casualties shown in column 2, which accrued to so-called operating employees as distinguished from non-operating employees, Mr. Greer? A. Yes, the date is actually shown in the number of casualties on page 8, the next table we are going to discuss.

Q. Let's turn to page 8. A. This table, unlike the previous two, covers the fiscal years ending August 31, so that we can make a direct comparison of full twelve months periods for the twelve months ending August 31, 1962, to 1966, a total of five years.

Q. With respect to that comment about full twelve months period, Mr. Greer, do you know whether or not there are factors [310] of a seasonal nature which account for changes in frequency of accidents throughout a given twelve months period? A. Yes, there is obviously a certain amount of seasonal variations. It is not consistent from one year to another because there are many factors involved. But on the average you will find that there is a certain seasonal trend to the frequency of accidents and casualties in the railroad industry.

Q. That is eliminated by the use of the twelve month period device that you have just referred to? A. Yes,

that makes each twelve months period a full year's operation.

Q. Will you discuss the table on page 8? A. The data on page 8 are in terms of the actual number of casualties. First, in column 2, to persons of all classes, in column 3 to employees on duty, and in column 4 it is limited to train and engine service employees on duty, that is, the engineers, fireman, conductors, and brakemen; in all classes of service. Again, in column 5 we have shown the percent of freight and yard operations without firemen. The first block of figures show the casualties, including fatalities, and in order to show some measure of the number of fatalities involved, the second group of figures relate only to fatalities which are, as indicated, included in [311] the casualty figures. Thus, in 1962, 127 employees on duty were fatally injured, in 1966, 118. In 1962, 78 train and engine service employees on duty were fatally injured; 1963, 103, and in 1966, 89. The percentage changes are shown in the bottom two blocks of figures. On page 9 this same data has been converted into frequency rates in terms of the units of transportation produced by the American railroads, that is, locomotive and motor train miles. I would like to specifically point out that the, in column 3, for example, in 1962 there were .14 per million, fatalities per million locomotive and motor train miles.

Q. You are referring now to the figures appearing in the second block? A. In column 3, yes. And in terms of train and engine service on duty, .09 in 1962, and again in 1966.

Q. What does the table on page 9 show, Mr. Greer, with respect to change in the casualty rate during the period of time when substantial operations have been conducted on American railroads without firemen in freight and yard service? A. Those would be the twelve months periods ending in August, 1965, when 42 plus per cent of the operations were conducted without firemen, and

in 1966 when 52.8% were conducted without firemen. You will note that in column 2 in terms of persons [312] of all classes, the frequency rate went down 4.2% in 1965, and 3½% in 1966. Employees on duty the casualties went down 2.9% in 1965 under 1964, and 7.3% in 1966 under 1965. The same magnitude of decreases is shown in column 4 related solely to the train and engine service employees on duty.

Q. At page 10 of your exhibit, Mr. Greer, you have data in terms of gross ton miles. Would you please explain first what the gross ton miles deviser involves? A. Yes, this is the measure of the gross business handled by the railroads in terms of the weight of the equipment and the weight of the lading. It is a measure which not only deals with the number of trains operated, but brings into the measure also the number of cars in the train operated.

Q. Does the table at page 10 show a trend in casualty rates similar to that shown by the table at page 9, Mr. Greer? A. Yes, it does, and it shows that, for example, between in the first quarter of 1965 there was an increase of 8.3%, following a decrease in the previous quarter in 1964 of 11.2%. But in 1966 when the operation almost reached the halfway point without firemen, 49.9%, there was a decline of 12.6%. Each of the quarters shown there show that there is a variation from quarter to quarter, as there is in all forms of accidents, and it also shows that such variations occur in relation to the extent of freight and yard operations without firemen, as shown in columns 13, 14, and 15, have [313] no relation.

Q. Starting at page 11 of your exhibit, you have data which differs in form somewhat to that previously discussed by you. To what railroads is this data limited, Mr. Greer? A. As is indicated in the footnote on page 11, this data is limited to carriers which were parties to Arbitration Award 282, and these sixty-seven carriers represent 96% plus of train miles of all Class 1 line-

haul railroads operated during the twelve months ending June, 1966. I have examined the data that is published by the Interstate Commerce Commission, and had drawn off for these sixty-seven railroads the number of train accidents, and as we shall see on subsequent pages, certain casualty data, and I have divided the railroads into two groups, based on, as is indicated in the second block, the per cent of freight and yard service operated without firemen on those sixty-seven railroads for the twelve months ending June, 1966. The thirty-five carriers that are included in the first column of figures are those carriers which during this period operated a higher than average per cent of operations without firemen in freight and yard service. As seen in the third column, during this period ending June, 1966, on these sixty-seven railroads, 52.2% of all of the freight and yard operations were conducted without [314] firemen. The thirty-five carriers that have been summarized in the first column of figures are those carriers that operated more than 52.2%, and the thirty-two carriers are those that operated less than 52.2%. Now, the average for the two groups was, as stated on the table, 66.4% for the group with the larger extent of operations, and 37.2% for the group with the smaller extent of operations. Since this was done on the basis of weighted averages, it is, as is indicated, this divides these sixty-seven railroads into two approximately equal groups. The thirty-five carriers operated about 52% of the train miles in that period, and the thirty-two carriers, representing this group with the smaller relevant per cent of operations, about 48% of the total train miles.

Q. Those are the figures appearing in the first block of figures on your table? A. Yes, sir. This first table in this series deals exclusively with train accidents.

Q. What does the table show with respect to the period 1964 to 1966 when the Award of Arbitration Board 282 was in effect, Mr. Gr[illegible]er? A. It shows, as is indicated

on the last line, that between 1964 and 1966 the thirty-five carriers which had the much larger degree of operations without firemen, had an increase of 10.2% in the frequency rate of train accidents, whereas [315] the thirty-two carriers with the smaller per cent of operations without firemen over this same period, 1964 to 1966, had an increase of 33%.

Q. At page 12 of your exhibit, do you have data relating to collision rates with respect to the same groups of railroads, Mr. Greer? A. Yes, sir. This table is identical in format to the preceding table except that it deals only with those train accidents that occur that were classified in accordance with the ICC regulations as collisions between trains.

Q. Within the group of train accidents, what kind of subdivisions are there, Mr. Greer? A. There are three groups—collisions, derailments and other or miscellaneous train accidents which do not either involve a collision or a derailment.

Q. What do the collisions involve to be reportable as such? A. Well, first of all, it must involve property damage of more than $750. There may or may not be any personal injuries involved. And it must involve a collision of a locomotive and cars with other locomotive and cars. It does not include, included as a collision is not a collision of a locomotive with, for an example, an automobile at a grade crossing. That would not be classified as——

Judge Van Oosterhout: That would come in the other?

A. That would come in the other, yes, sir.

[316] Judge Van Oosterhout: The other miscellaneous category?

A. Yes, sir.

Q. A collision at a grade crossing might conceivably be a train accident if, might conceivably be only a train service accident if there is no damage in excess of $750? A. That is right. Many of the train accidents that occur,

many of the accidents that occur at grade crossings, in fact the majority of them, are classified as train service accidents. But there are some that are classified as other train accidents, because they do damage to railroad property of $750.

Q. Mr. Greer, referring again to the twelve months, to the twenty-four months period of June 30, 1964, to June 30, 1966, what does the table show with respect to changes in collision rates as between the two groups of carriers that you have studied? A. As is indicated on the bottom line, the thirty-five carriers with the larger percentage with freight and yard operations without firemen had a 17.9% increase in the collision frequency rates, contrasted with the 31.3% increase for the thirty-two carriers that had the lesser extent of operations without firemen.

Q. At page 13 of your exhibit, Mr. Greer, you have dealt with casualty rates in train and train service accidents. Would you please explain the data which appears at that page. [317] A. Yes, as I have previous indicated, it is identical in format to the other tables. There are the total casualties in train and train service accident, that is, casualties to all classes of persons, employees on duty, persons at grade crossings, and others. Between 1965 and 1966, the last year in the series, you will note that the thirty-five carriers showed a decline of 3.9% whereas the thirty-two carriers, a decline of 2.8%. Now, between 1964 and 1965, the earlier year of this two year period, the thirty-five carriers showed a decline of only .9%, the thirty-two carriers of 6.4%. But in the last year the percentage decline was just about the same. So that as a result for the two year period the thirty-five carriers showed a decline of 4.7% in the train casualty rate, and the thirty-two carriers, 9%. The table on page 14 is also a casualty table, but here the casualties are only those to employees on duty in train and train service accidents. Now here between 1964 and 1965, the thirty-five carriers showed an increase of 1.7%, the thirty-two carriers a de-

cline of 5.4%. Between 1965 and 1966, the last year of this spread, and the year in which there was the greatest percentage of operations without firemen, the thirty-five carriers and the thirty-two carriers a decline at about the same rate, 7.4% and 7.2%.

[318] Q. With respect to highway grade crossings accidents on page 15 regarding your sixty-seven carriers. A. Yes, sir. These are the casualties and highway grade crossing accidents expressed in terms of rate per million locomotive and train miles like the preceding tables. Looking at the last block of figures again and looking at the changes between 1964 and 1965, the thirty-five carriers had a slight decline, the thirty-two carriers a slight increase. And between 1965 and 1966 the thirty-five carriers had an increase of 4½%, the thirty-two carriers an increase of 4.0%, decreases and increases of about the same magnitude over this period.

Q. The sixty-seven carriers involved in this study are listed at pages 16 and 17 of your exhibit? A. Yes, those carriers on page 16 are the thirty-five carriers that operated more than 52.2%—that should be 52.2%. Correct that if you will, please. And the carriers on page 17 are those that operated less than 52.2%, of their freight and yard service without firemen during the twelve month period ending June 30, 1966.

Q. Turning to Section II or Section IV of your exhibit, Mr. Greer, at page 18. Have you—does the National Railway Labor Conference from time to time accumulate date regarding the requirements of the various states with respect to the [319] consist of crews? A. Yes, sir.

Q. Did you utilize that data in preparing the table that appears at page 18 of your exhibit? A. I have.

Q. Would you just briefly explain what appears at page 18 of your exhibit, Mr. Greer? A. Yes, the first block deals with the states that currently have minimum crew laws. There are fifteen of the states. The type of service to which these laws are applicable are shown by the

"X's" in the various columns. Inasmuch as passenger service crew requirements are not involved in the present proceeding, perhaps it will not be necessary to describe that particular aspect of the statutes in detail. In freight service seven states are shown as having currently effective crew consist requirements. In Arkansas, of course, the requirement in freight service is a minimum crew of six on trains consisting of twenty-five cars or more, and a crew of five on trains with fewer than twenty-five cars. In Indiana the law requires a five-man crew in freight service on trains with fewer than seventy cars and a six-man crew on trains with seventy or more cars. The Indiana statute with respect to switching crews, however, imposes a requirement of five crew members consisting of an engineer, [320] a fireman, a foreman, and two helpers, only five men. The Nevada statute requires a crew consisting of five men on freight trains in excess of fifty cars, but the requirement of a fireman in such crews has been held to be inapplicable to trains operating with or powered by diesel locomotives. Therefore, the law under current operations really requires only four men, an engineer, a conductor, and two brakemen.

Mr. Youngdahl: I would like to object to his reading page 18, and particularly describing——

Judge Van Oosterhout: I presume that the legal requirements, we had probably better use other sources for it.

Mr. Lucente: Yes. The witness was not trying to interpret the statute, if the Court please. He is——

Judge Van Oosterhout: I think it would be better if it is relevant for the counsel to cover it by briefs as to where the Court can locate the statutes.

Mr. Lucente: Very well.

Q. At page 19, Mr. Greer, does the information that you have there with respect to what has occurred in the various states allowing legislative changes. Was that data

accumulated by the National Railway Labor Conference in which you direct your research? A. Yes, sir.

Q. I don't believe any discussion of that is necessary. I might for the Court's information state that the quote [321] there from the Presidential Railroad Commission comes from pages 63 and 64. It is not identified. It is one of the documents that is in evidence. Now, turning to the data that appears on page 20 of your exhibit, Mr. Greer. Explain briefly what you show there. A. Yes, this date comes from the published material of the Interstate Commerce Commission and the Statement M-400 and it shows, the data in M-400 shows certain accident casualties numbers by states of the various states of the United States. On page 20 I have shown in the upper section the number of train accidents that occurred in Arkansas, that occurred in the United States as a whole, for the 12 months period ending June 30, 1966. The state data published by the ICC in Form M-400 comes out on a quarterly basis, and for that reason this series of tables must begin with the quarter ending June 30, 1966, because that is the latest of the reports of this type that the Commission has published.

Q. With respect to train accidents, what does the top half of the page show comparing Arkansas and the other states as to operations during the year 1966? A. It shows that in Arkansas in column 4 there was a 26% increase in the number of train accidents. Whereas in the United States as a whole there was 11.6% increase. Now, this data, it is not possible to convert to a measure [322] of frequency such as train miles, locomotive and motor train miles, because the Commission does not publish a state data of that type. So here we are merely comparing the aggregate, absolute figures on a percentage basis. But barring any really unusual differences between the changes in volume of traffic, the data on this table and the following tables do give you a good general idea of the relative frequency and the relative change in the frequency of the

accidents. The bottom half shows the changes in casualties in train and train service accidents of a period from 1962 to 1966, the twelve months period ending June 30 in each year.

Q. Referring now to the figures starting with June 30, 1964, what do your comparisons show as to the per cent of change for Arkansas and other states in the years of June 30, 1964? A. 1964 shows a decline of 2% in Arkansas and a 5.6% increase in the United States as a whole.

Q. During that year, Mr. Greer, the Award of Arbitration Board was in effect how long? A. Between May 7, 1964, and June 30, 1964 of that fiscal period.

Q. During the next period shown was the Award of Arbitration Board in effect for the entire twelve months period? A. It was.

Q. What percentage of operations were conducted without firemen [323] on carriers in the United States? A. It is indicated in column 9 39.2%.

Q. What was the percentage change in casualties derived from train and train service accidents for Arkansas and other states? A. In Arkansas there was an increase of 2½%. In the United States as a whole there was a decline of .8%.

Q. Referring to the data appearing in column 8 of the table. Does it appear from that column that the percentage of train accidents in Arkansas, or rather the percentage of casualties in Arkansas to the United States total was the same in 1964 as it was in 1966? A. Yes, it was. They were both 1.18 in both periods.

Q. Turning to page 21 of your exhibit, Mr. Greer——

Judge Van Oosterhout: May I interrupt the question. What is this indices? Is that anything significant? It is the headings of columns 4 and 5 in the top, and 6 and 7 in the bottom.

A. Yes, sir, it merely shows the change over the entire period in relation to 1962. Thus, in column 6 we show a

26¢ increase, the indices is 126, in the United States it is 144 for that period. From Arkansas a decrease——

Judge Van Oosterhout: It is a percentage of the base period figures. Is that right?

[324] A. That is right. That includes, of course, the years 1962, 1963 and the greater part of 1964 before there was any change in the crew size as a result of Arbitration Award 282, and it shows the two years after that period.

Q. With respect to the first three entries for the State of Arkansas in column 6, the bottom half of the table. Does it appear, Mr. Greer, that the decline in the indices occurred primarily before, occurred primarily in the month and years preceding the effective date of Award 282? A. Yes, there was an 11% decline between 1962 and 1964, and then a further decline to 85.7, or about 3% or 4% in the next two years.

Q. Page 21 of your exhibit have you made a comparison on the basis of the same data with respect to the states of Arkansas and adjoining states, Mr. Greer? A. Yes. The six states that adjoin Arkansas in the first group, and then Arkansas is shown separately. In the upper block the figures again relate to train accidents and the percentage change in the numbers of accidents. The lower block deals with casualties in train and train service accidents.

Q. With respect to the percentage change in casualties in train and train service accidents, Mr. Greer, what does the table show for the period of 1964 to 1965? A. It shows that the six adjoining states to Arkansas had a 4.4% decline, whereas Arkansas shows an increase of 2½%.

[325] Q. That was the period from June 30, 1964, to June 30, 1965? A. That was a full year of operations without firemen in the six adjoining states——

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Q. These figures show a pattern of variation from year to year, do they not, Mr. Greer? A. Yes, they do. As is

indicated in practically every one of the percentage columns from one year to another in the states, and the states as a group, there are these variables that are entirely unrelated to any fact which you can isolate.

Judge Henley: May I inquire what accounts, if you know, for increase—I am looking at the top portion—the increase in the percentage of change in train accidents 1965 to 1966, 1962 to 1966. I can understand the 1962 to [326] 1966. What causes this 19.8 and 26% percentage change in train accidents in 1965 to 1966 here? A. Well, to what caused it, in terms of the precise reason, I am not in a position to state. As indicated between 1965 and 1966 there was, for example, in Arkansas an increase of train accidents, and that was 26%. In the six adjoining states there was an increase of about 157, and that was 19%. Over this entire period there was an increase in the United States of 11%. Some of the factors that are attributive to that are those that I mentioned earlier, but there has been an increase in property damage train accidents, at the same time there has either been a decline or a relatively small increase in casualties.

Q. Do you have anything further from the table on page 21? A. No, sir.

Q. On page 22 you have a break-down now which, as I understand it, compares states with laws requiring firemen on diesel locomotives, and the other states covered by the Interstate Commerce Commission report. Would you please discuss that table, Mr. Green? A. Yes, sir, the states with currently applicable laws requiring firemen on diesel locomotives are the seven states enumerated in each block of this table. Of the seven states as indicated by the asterisk, Oregon and Washington, the law requiring [327] firemen on diesel locomotives is not applicable to yard service. On this basis of the requirement of firemen on diesel locomotives, I have shown the totals for the five states whose laws require firemen on both freight and yard engines, and then a total for the seven states. Again

the top section deals with train accidents and the bottom section deals with casualties in train and train service accidents. Looking at the train accident picture we see that the seven states and the five states, the five and seven states both declined between 1962 and 1963, whereas all other states increased in the United States increased by smaller magnitude. And right straight across we will see ups and downs, and of course, it is evident that those ups and downs are not explained by the difference in crew sizes.

Q. To illustrate that point, Mr. Greer, for 1964 to 1965, which, as I understand the table, is June 30, 1964 to June 30, 1965. What does your table show with respect to increase in train accidents in the seven states requiring firemen on diesel locomotives and the other states? A. The increase in the seven states between 1964 and 1965 was 25½%, and all other states 9.6%. Now, during the next period, 1965 to 1966, the next annual increase for [328] the seven states the increase was only 4.6%, all other states increased 13½%.

Q. But had there been a similar change in the trend, or a similar relationship in the trend for the year 1962 to 1963 as the one that you pointed out for the period 1964 to 1965? A. Yes, these are year to year variations, and this table as well as the other tables in this series illustrate that there is just no relationship between the changes in frequency of train accidents and the crew size. That is evident by these tables. Now, the——

Judge Miller: What did you say now?

A. I said that these tables illustrate the fact that there isn't any relationship between the size of the crew in terms of operations without firemen and the changes in train accidents among the various states and in the United States as a whole.

Judge Miller: All right.

Q. The bottom part of that table shows the per cent change in casualties. I will ask you generally, Mr. Greer,

is the trend much the same as shown by the trend in train accidents in the upper half of the table? A. Yes, it shows a varying situation. For example, between 1964 and 1965 the seven states showed an increase of 1.7%. All other states 1½%. But in 1965 to 1966 there is a [329] decline in the seven states of 4% compared with the other states of 1.7%. So you have this variation.

Mr. Lucente: If the Court please, starting at page 23 of Mr. Greer's exhibit, I called Mr. Greer's attention to quotations from the so-called Norwood case. My examination of the opinion have indicated that this was the extent of the statistical data appearing therein with respect to safety of operations. But I asked Mr. Greer then to prepare a table that appears at page 24 that permits a comparison of certain limitations between the data recited by the court in the Norwood case and the currently available data.

Q. Will you discuss the table that appears at page 24, Mr. Greer. A. Yes, sir. This data, as is indicated, was taken from the ICC accident bulletins and statement M-400. I have shown the train accident data and the casualty data, both in terms of actual numbers and the rate, as measured by locomotive and motor train miles, for the five years 1925 to 1929, 1928 being the figure recited in the excerpt from the Norwood case on the preceding page, and the absolute figures, the number figures of collisions and derailments are those that the court cited. I have also shown data for the year 1956—that was the last year before the definition, monetary definition of train accidents was substantially changed, and [330] data for the years 1961 to 1965—1961 is the first year in which the definition of a casualty to an employee on duty was reduced from the 72 hour basis to the 24 hour definition, which I discussed. The, one has to only glance at the numbers and the rates to indicate that there has been a marked decline in the frequency of collisions, derailments, total train accidents, and in the casualties to employees

on duty in terms of those killed and injured. There has also been a marked decline in the number of locomotive and motor train miles over this period, and while the definitions of the Interstate Commerce Commission have changed in some degree over the period, there has been no substantial change of any kind that would invalidate the actual casualty, this fatality experience that is shown in the column headed "killed", and the injury such invalidation of the long-term trend insofar as injury is concerned are this. Prior to 1961 these injuries that were reported were injuries in terms of three day injuries and subsequent to 1961, in 1961 and subsequent thereto they are only one day injuries, so that such change in the trend works to the disadvantage of the later years. However, you will note that the declines are substantial from the neighborhood of 26, 27 to 12.08 in the injured rates as shown in column 11.

Q. The subject of the limitations or comparisons that you [331] have already described, have you shown on pages 25 and 26 of your exhibit, Mr. Greer, the general trend in casualties for all railroads in the United States? A. Yes, I have, in terms of numbers on page 25, and the double lines between 1956 and 1957 and 1960 and 1961 reflect the changes in reporting regulations which I have previously described. Looking at, of course, the fatalities to employees on duty we find that there has been a marked decline. Casualties declined markedly. Number of train accidents have declined from the earlier period. Over the long period these data on page 25 and also as they have been converted to exposure rates in terms of train and train service accidents and casualties per million train miles a declining frequency as measured by the units of operation.

Q. Now, turning to the final portion of your exhibit, Mr. Greer, have you compiled accident and casualty data limited to the five plaintiff railroads listed here? A. Yes, the table on page 27 shows as information in evaluating

the material that follows the mileage operated by states of the five major Arkansas railroads. These railroads are the Chicago, Rock Island & Pacific, the Kansas City Southern, the Missouri Pacific, the St. Louis-San Francisco, and the St. Louis-Southwestern. And in terms of miles operated in Arkansas, as is indicated on the second line, [332] about 14½% of the mileage of these railroads is operated in the State of Arkansas. The data that follows was compiled from summaries furnished me by the railroads of their reports to the Interstate Commerce Commission for the period involved, that is, the years 1961 to 1966. The data shown for train accidents, that is, the property damage accidents. There is data for the total casualties in train and train service accidents. Casualties to employees in train and train service accidents. Fatalities in total and fatalities to employees in train and train service accidents.

Q. Have you shown that data on the basis of frequency rate at page 29 of this exhibit? A. Yes, I have.

Q. Would you please discuss page 29. A. On page 29 we have shown the data both in terms of frequency rates——

Q. Page 29? A. On page 29—in terms of frequency rates per million locomotive and motor train miles in the first three columns of figures, columns two to four, and then also in terms of car miles and gross ton miles. Now, we will deal primarily with data in columns 2 and 3. In looking at the train accidents for the year 1966, the frequency rates in Arkansas was 5.66 per million locomotive miles, [333] and the frequency rate in the other states in which these five railroads operated or operate was 5.42%. That 5.66 for Arkansas is an increase of 30.7% between 1963 and 1966 as compared to the 15.6% in states other than Arkansas. The casualties in train and train service accidents the rate in Arkansas in 1966 was 17.89, for the other states 19.61. Between 1963 and 1966 Arkansas declined 9.7% and the other states 2%. But in the bottom

group we see that in terms of casualties to employees, the ratio in Arkansas 8.49, and the other states 9.57 per million locomotive motor train miles, and the decline were approximately the same magnitude in 1963 and 1966, 8¼ for Arkansas and 6.8 for the other states.

Q. You are referring to the final line there, in column 2 and 3? A. Yes. Now then, again referring to the bottom block of figures, between 1965 and 1966, the year, of course, of the greatest impact in the reduction of crew members pursuant to Arbitration Award 282, Arkansas showed an increase of 5.7%, and the other states a decline of 3.1%. In general, the trend shown in the data for the other measures of accident exposure, car miles and gross ton miles, are of the same type.

Q. Does this conclude your discussion of the exhibit, Mr. Greer? [334] A. Yes, sir.

Mr. Lucente: If the Court please, in connection with our arrangements before trial, we served on—by we, I mean plaintiffs—we served on the attorneys for intervenors and the defendants copies of additional exhibits that we stated at the time that we intended to introduce when Mr. Greer was on the stand. The exhibits thus served and identified consist of a report of an Emergency Board involving the railroads of the United States and the Brotherhood of Locomotive Firemen and Enginemen issued in 1950, an Arbitration Award again involving the Brotherhood of Locomotive Firemen and Enginemen and the major carriers in the United States, a report of the Public Service Commission of the State of New York which pursuant to a legislative mandate has investigated in 1960 to relationship, if any, between the crew requirements imposed by the New York statute and safety of railroad operations, and also the report of the Royal Commission in Canada, which in 1957 investigated the question of whether or not the Canadian Pacific should be required to use firemen on diesel locomotives in freight and yard service, and recommended that the railroads be permitted

to eliminate firemen positions in those two classes of service. The reflection that occurs that these are primarily matters with respect to which the Court can take judicial notice. [335] Rather than introduce the exhibits through Mr. Greer, I would like, if it please the Court, to identify them as exhibits and to furnish them with the understanding that they are furnished for the purpose of informing the Court's judicial notice, under the principles applicable to such documents. Is that procedure permissible? I do not, in other words, wish to have Mr. Greer sponsor these.

* * * *

[337] Mr. Lucente: I offer Plaintiffs' Exhibit 109.

Judge Van Oosterhout: 109 to 113, inclusive. Are these Board No. 70 and Board No. 130 with relation to the crewmen, people other than the firemen that went back to local boards?

Mr. Lucente: The Board of Emergency Board No. 70 was issued in 1950 involved a dispute between the carriers and the Brotherhood of Local Firemen as to whether or not an additional fireman should be put on diesel locomotives because the firemen's organization claimed that the firemen aboard the diesel was spending so much time back in the engineroom that it was impossible for him to perform his lookout functions. The President created an emergency board pursuant to Section 10 of the Railway Labor Act investigated that dispute and made the report identified as Plaintiffs' Exhibit 110, in which it held, in effect, that the head brakeman employed on diesel locomotives constituted a sufficient lookout in the fireman's absence, and an additional employee was not needed.

* * * *

[338] Mr. Youngdahl: As to Plaintiffs' Exhibit 109 which document purports to be statistical analysis which has been discussed by Mr. Greer. We have a three-fold objection but wish to not object to certain specific portions of

it. Objection number 1 and the primary one is that the document is a monumentally misleading document of artificial selection which are not in accord with ordinary statistical standards and procedures. I will not go into further detail on that anticipating that the Court may reserve ruling——.

Judge Van Oosterhout: I rather think that will be most satisfactory.

Mr. Youngdahl: Well, I don't think I need to mention my second objection which is related to that, as well, but the particular other portions of that document which I wish to refer are those selected quotations from various cases and decisions that we contend to be in the case of the decision of Presidential Railroad Commission, for example, of hearsay, and irrelevant and immaterial for other grounds that I have stated at various times in the hearing. I wish to except from my objection, however, the bottom half [339] or the right half of page 19, which details the repeal of full crew laws by legislatures and popular referendum, which in fact is the method which we contend is the really available one, and Mr. Greer saved us the trouble of presenting that evidence. I also do not object to the appendix which contains the reporting procedures for accidents employed by the Interstate Commerce Commission.

Judge Van Oosterhout: By that, you mean the last section?

Mr. Youngdahl: Yes, sir. The appendix. As to Plaintiffs' Exhibit 110, as Mr. Lucente has just stated, it was issued it says on its face in 1949, although I think he said 1950. It is a report of an emergency board, as I understand it, about whether or not there should be two firemen in 1949. Now, I think the question of whether there be two firemen in 1949 as compared with the question of whether the State has the power to find that one fireman is essential for safety, or is an aid to safety, makes it so remote and immaterial that it should not be admitted, and it is for mat-

ters of relevancy and material that we object to Plaintiffs' Exhibit 110.

* * * *

[340] Mr. Youngdahl: I have not had an opportunity to look at Plaintiffs' Exhibit 111 except that insofar as it has the characteristics of Plaintiffs' Exhibit 110, and we would object to it on the same grounds. As to Plaintiffs' Exhibit 112, which is the New York Public Service Commission investigation report, it again was issued in 1960, a time which is somewhat passed, in a state that is some distance from Arkansas. It is irrelevant and immaterial, it is hearsay, and it has a peculiar infirmity in addition to those in that subsequent to that time the New York Supreme Court passed upon the New York full crew law, taking into account the very investigation which is now offered by Plaintiffs in this case, as support of its position on the Arkansas full crew laws. The New York Supreme Court in that connection noted that the Public Service Commission investigation and report were particularly incompetent, I think were the words that were used, because they did not involve the same issue as those before the Court, which are the same before this Court concerning the power of the State to make the type of decisions it made in connection with the full crew laws. As to Plaintiffs' [341] Exhibit 113, it shares the hearsay relevance and materiality objections, I believe, in connection with the other documents. It is the Royal Commission report handed us, which also discusses, as I recall, Sweden, Africa and a number of other places. But in any event, it has very little to do with current conditions in Arkansas, and more particularly with the power of a State to enact the laws which is the only issued before the Court here.

Mr. Lessenberry: I have nothing to add to that.

Judge Van Oosterhout: But you join in it?

Mr. Lessenberry: Yes.

Judge Van Oosterhout: Very well. Well, I think as coun-

sel indicated, there may be some significant legal problems with respect to admissibility of some and also the alternate if they are proper as evidence, they are matters in which the Court should take judicial notice of it, and I assume that counsel ultimately include a discussion of those items in their respective briefs. So, for the present, the exhibits will be received, subject to the objections. Some of them may be a little remote, in fact, the Canadian deal and may not show the circumstances——

* * * *

[343] March 22, 1967.

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Cross-Examination,

By Mr. Youngdahl:

Q. Mr. Greer, has your entire professional and business life been as an employee of the railroads? A. Yes, sir.

Q. When did you first begin working for a railroad or railroad connected organization? A. May 1, 1934.

Q. How old were you at that time? A. Nineteen.

Q. Have you had any formal training in statistics? A. Yes, sir. Most of my formal training was received at Northwestern University night school. And I took statistics and accounting. I was majoring in accounting. I went there and St. Louis University for over five years.

Q. Is that while you were employed by the railroad or railroad connected organizations? A. Yes, sir.

[344] Q. What portion of your experience in which you referred to be an examiner and chief examiner that was not a governmental or independent job, but rather was an examiner for or chief examiner of a railroad? A. For the Association of Western Railways.

Q. It was, in any event, a management and not a neutral function. Is that correct? A. Yes, sir.

Q. I think your exhibit with the ICC accident categories or codes indicate, doesn't it, Mr. Greer, that there are many, many causes of accidents on railroads? A. Yes, sir.

Q. Do you agree with that? A. Yes.

Q. Do you agree that in many instances there are causes which are combinations of causes. Is that correct? A. Yes, sir.

Q. When there is an accident which is a combination of causes, how is the selection made as to how to code the particular accident? A. Presently the coding is done by the Interstate Commerce Commission on the basis of the factual material supplied by the carriers on their Form T reports.

Q. Well now is one cause selected as the predominant cause when there is a combination of causes which causes an accident? [345] A. If it is possible to do so on the basis of the facts, otherwise they will classify it as miscellaneous, precise cause not determined.

Q. Is it that latter course which they frequently follow when there are multiple causes and it is difficult to identify one as the predominant one? A. I don't know that it is frequent. I am sure that it does happen on occasion.

Q. Earlier days the railroads themselves coded the causes, didn't they? A. Yes, they did.

Q. At that time did you have anything, any connection with such coding process? A. No, except to the extent that when I was in the operating department and out on the divisions during the years 1940 to 1945, I originated the data that went on the Form T report. But the actual Form T final reports were made in the general office in Chicago.

Q. During the connection with coding that you have had, what has been your experience as to how to assign a code number to causes that are multiple when no one particular cause is predominant? A. Well, if there is no one particular cause predominant, you have to classify it as miscellaneous, as I recall, under the instructions.

[346] Q. Is weather a factor in railroad accidents, ever? A. Oh, I think it is a contributing factor, yes.

Q. Probably one of those things which is, or makes an accident more severe. It might otherwise be less severe if it weren't for the bad weather. Is that correct? A. No, I wouldn't agree with that characterization.

Q. What kind of effect does weather have on accidents? A. Well, obviously if, for example, a train is going through a snow storm or fog and the wayside signals are difficult to see, and the crew is operating the train doesn't strictly comply with the letter of the operating rules but rather takes a chance on being able to observe the signal as they go by it, they may miss it. Obviously, if there is extreme fog or snow and fuses are put out they are not as readily seen in absolutely clear weather. So that is the type of thing I had in mind when I said that it wouldn't necessarily make it more severe.

Q. Is rain as well as snow and fog a weather factor which might aggravate accidents? A. It depends on what kind of accidents we are talking about.

Q. Any kind of accident. A. Well, as you indicated, there are many causes of accidents, and in order to answer your question specifically, I think we should narrow the area.

Q. Can you think of any accidents which rain might aggravate? [347] A. Well, I should expect that if you are talking about an accident where an individual slips or stumbles or falls, and the footing is not as good because of rain, that could be a contributing cause to that type of accident.

Q. Is topography ever a factor in accidents? A. Well, I don't think it can be said to be a direct cause, but contributing cause, yes. If an accident occurs when a train is stopped, if you are talking about the rear end collision, for example, and the train is stopped right around a curve and the flagman hasn't gone out a sufficient distance to

protect against that eventuality, that could be a contributing cause of a collision.

Q. I suppose in the matter of grades or incline, a brake failure might be much more severe or probably much more likely to produce an accident when it occurs on an incline as compared with a flat or level piece of track. Is that correct? A. By brake failure, you mean where the brakes do not work properly because of some defect?

Q. For example. A. Yes.

Q. Might also mention, aren't there occasions in which the brakes are set on cars if only a portion of railroad cars and the degree to which brakes are set much be evaluated in relation to the incline to that particular piece of track? [348] A. Yes, that would be true.

Q. The number of cars on which the brakes are set would depend upon how inclined the piece of track is. Isn't that correct? A. Yes, and a failure to set the brakes would, of course, and if the cars got away they would go down the incline. But if sufficient brakes were set to take into account the topography, there should be no get away of the cars.

Q. I suppose that is a matter of judgment in each case based upon experience of a particular crew members who are in the process of setting the brakes? A. Adjustment and experience.

Q. Now, there is a category of accidents in the appendix to your document there which I think is due to the word negligence. Are you familiar with the category I am referring to? A. Yes, sir.

Q. Do you know what the term negligence means in a legal sense? A. I wouldn't be qualified to answer that in a legal sense.

Q. What does the term negligence mean in the sense of that ICC classification? A. It means a situation where the employee involved was either careless or indifferent or unwittingly failed to [349] carry out the prescribed

rules and regulations, or because of distraction or other situations he placed himself in a precarious position. He got off, for example, of a car that was moving at too rapid a speed, or he ran too fast for the track conditions, weather conditions, or he passed a stop signal, a position that should require him to stop but he didn't have his train under control, and that type of thing.

Q. It doesn't necessarily mean that the employee is at fault, does it? A. Well, it carries a degree of fault in the terms that if he had not, if he had fully complied with the rules and regulations to take into account all of the conditions that existed, the accident probably would not have occurred.

Q. What about conditions that existed which he did not know or could not reasonably have known under the circumstances? A. Then that type of situation should not be classified as a negligence of employee case.

Q. Where in the ICC codes or categories would such a situation fall? If it would not fall there in what is called the negligence category? A. Depending upon what type of circumstance he failed or he was not in a position to observe or determine.

Q. In the event that a brakeman fails to set the brakes of [350] enough cars to hold the group of cars on an inclined piece of track, and an accident resulted because the cars then started going down the incline. Would that be classified as negligence in the sense of the ICC terminology? A. I think it should be, yes. On the fact that you have described.

Q. What if, at the time when he set those brakes, he did not know and could not have known that a group of other cars were going to be added to that string. Therefore he set only enough brakes to handle the original group, and then an accident took place. That would still be, in the sense of the ICC terminology, negligence. Isn't that correct? A. Well, it depends on the circumstances.

Certainly if you have a situation where one crew leaves a cut of ten cars with sufficient brakes to hold it on an incline, and several hours or days later another crew places another thirty cars on that same track, then the first man certainly would not be charged with negligence. It would be a question of fact as to what the second crew might be charged with.

Q. Would you look at page 13 of the Appendix of Plaintiffs' Exhibit 109, where it says "Code causes" and says "Train Accidents", "1. Negligence of Employees", and there follows a whole group of things which continue up to page 14 of [351] the Appendix where it says "Defects in or Failure of Equipment". Now, as I understand it, that listing encompasses all of the things that any employee failed to do or did improperly which causes an accident, a train accident in this case. Is that correct? A. Well, it purports to set out all of the ones for which there is a, that will fit specifically into the categories named, and the Code 1988 on page 14 captioned or designated "other negligence of employees" is designed to take care of the cases that do not fit into these prescribed codes.

Q. Will you show me in the Appendix where is the code classification where that kind of accident occurs because an employee failed to do something without fault on his part, something unforeseen happened that he knew nothing about. He couldn't reasonably been expected to take any different action than he took. And yet an accident occurred. Where in this series of classifications does such an accident fall? A. It wouldn't be in that classification. It would be in the miscellaneous causes and unable to determine.

Q. Unable to determine? Where is that, Mr. Greer? A. For example, it might be in Code 4588, other combinations of two or more causes, or it might be in other ascertained causes, or it might be in causes which there could be

[352] no determination on the basis of facts presented. For instance, 4688, accident not investigated. There are other codes; I can't lay my hands on them here, but, without taking the time to look through here, which each category, each principal category has a miscellaneous to take care of the situation that is not precisely described in these classified codes.

Q. Did it occur that there is a train accident which if an employee had done something different an accident would not have occurred, and yet it wasn't the fault of the employee in the sense that he could not foresee what was going to happen? A. Oh, I think you could have a circumstance like that.

Q. That occurs fairly often, doesn't it, Mr. Greer? A. I don't think it occurs fairly often. I think it is possible that it does occur, but it depends on what you mean by the term "fairly often". What percentage of the accidents are you talking about? One per cent or fifty per cent?

Q. What would you count as fairly often? A. I would say something like ten or fifteen per cent might be determined fairly often, and I don't think it is that great.

Q. Ten or fifteen per cent of what? [353] A. Of the number of accidents that occur.

Q. What about the unexpected illness of a member of a crew where because he was suddenly stricken ill he was unable to perform something which he normally would have performed. What kind of category in the code would that go in? A. It depends entirely upon the circumstances of the accident.

Q. Can you set up any hypothetical type circumstances in which you could figure out what code it went in? A. I could, I suppose, set up some hypothetical circumstances. Those types of situations that you have just referred to are certainly infrequent. I don't say that they don't occur, but if there was an accident of that type it prob-

ably should be coded by the Commission in unable to determine the cause. In a miscellaneous cause is not specific. On the other hand, if—well, I tell you what, you give me the specific case, and I will tell you what I think it ought to be.

Q. You think—excuse me. A. I will tell you what I think the Commission might properly code it.

Q. You think that sometimes when an accident is caused by an employee's illness, that it should be coded as unable to determine the cause? [3] A. It depends on the circumstance.

Q. As to your Exhibit 109, Mr. Greer, let's see if we can't agree on two basic facts before we start. Fact one, that from May, 1964 up to the present time, there has been a dramatic reduction in the size of crews, train crews, engine crews and train crews over the country. Can we agree on that fact? A. Well, I would say that there has been a substantial reduction in the size of engine crews in light of the fact that currently some 55% of the freight and yard operations throughout the United States are being conducted without firemen. Now, whether you could characterize that as dramatic or not, it is substantial. But less reduction of the size in train crews because of the minor in which the, the different minor in which the Award of Arbitration Board 282 applied. My best estimate is that there has been a reduction of some, in the neighborhood of some five to seven per cent in the average size of train crews in freight and yard service, throughout the United States.

Judge Henley: What year did you use?

A. May, 1964.

Q. May, 1964, was the date of Arbitration Award 282's effectiveness as to firemen. Isn't that correct? [355] A. Yes, sir.

Q. And the decrease, I suppose, in 1967 in firemen, the rate of reduction has slowed a great deal. Most of the

reduction was in the early months. Is that fair to say? A. Yes, under the Award of Arbitration 282, it is now a question of attrition. All of the men with less than ten years of service have been transferred that can be transferred. All men with less than two years of service are subject to or were subject to removal have been removed, and now the change will be of a much more gradual nature.

Q. Reduction in the size of crews has continued then unabated with a difference in degree since May, 1964 up to date, and is likely to continue into the future. Is that correct? A. At a much lower level of increase, yes.

Q. All right, we agree then on this fact that, on fact one, there has been a substantial decrease in the size of crews on trains in freight and yard service from May, 1964 up to now? A. Substantial decrease in the size of engine crews in that the firemen are missing.

Q. I am thinking about them altogether for the moment. A. All right.

[356] Q. Now, let's see if we can agree on fact two. From May, 1964, up to date there has been a dramatic increase in accidents involving trains. Isn't that correct? A. There has been a substantial increase which started before May 7. It started in 1962, and has continued to this day in the form of property damage accidents which are classified by the Commission as train accidents.

Q. If you could for the moment, you will get a chance to say all those things in just a minute. If you just confine yourself, if you would, to my question which is, from May, 1964, up until now there has been a substantial increase in the number of accidents involving trains. Isn't that correct? A. There has been a substantial increase in the number of train accidents. Now, we are talking about the technical term, I suppose?

Q. I am not talking about the technical term, Mr. Greer. I am talking about accidents involving trains. Isn't that true? A. No, there hasn't been a substantial increase in

accidents involving trains. If we bring in the casualties, there has actually been a decline in the number of casualties and a decline in train service accidents are leveling off in train service accidents.

[357] Q. For the moment I am not talking about casualties. We will have plenty of chance to talk about casualties. I am just saying accidents involving trains. Do you not know what I mean by that term? A. If you mean the type which are reported here, the train accidents, the property damage accidents, the answer is yes. If you mean something else, I don't know what you mean.

Q. All right, let's take then if you insist, train accidents as the ICC defines them. There has been a substantial increase in train accidents from May, 1964 up until now. Isn't that true? A. Yes, sir.

Q. And the point or the burden of all these charts and documents involved in Plaintiffs' Exhibit 109 is that you are trying to show that there is no relationship between the substantial decrease in crews and the substantial increase in accidents. Isn't that correct? A. Are you still talking about this property damage accident?

Q. If you prefer to talk about that, I am willing to defer to you on that. A. All right.

Q. You are trying to say by these charts that from May 1964 up until now that there is no causal relationship between [358] the substantial decline in crews and a substantial increase in train accidents? A. That is not the majority of the charts in here. The majority of the charts in here deal with the casualty side, but to the extent that there are charts and data here that relate to train accidents, that is the purpose of them.

Q. You referred yesterday to reports of the Interstate Commerce Commission. How often, Mr. Greer, are the annual reports—they are issued annually, I guess that is clear enough. What dates are the annual reports issued and what periods normally do they cover? What physical year? A. Annual reports cover the calendar. If you are

talking about the annual accident report, the latest one of the reports the ICC published was for the year 1964.

Q. I am talking about the annual reports of the Interstate Commerce Commission. Are you familiar with those documents? A. The annual reports to Congress, you mean?

Q. Yes, sir. A. Oh, yes.

Q. What period do they normally cover? A. The fiscal year ending June 30.

Q. And what is the last such report that is now available? What fiscal year does it cover? [359] A. Fiscal year ending June 30, 1966.

Q. Are you familiar with that document? A. Yes, I have read it.

Q. Doesn't the Interstate Commerce Commission in that document refer to an alarming increase in train accidents? A. I believe that is the word they used.

Q. Is the language, the alarming upward trend in the number of train accidents continue unabated during 1965? A. Well, I can't recall whether that was the precise language but you are reading it, I will agree that that is it.

Q. And that is, when they say 1965, they are talking about the fiscal year ending June 30, 1966. Is that correct? A. Well, no, I don't know that that is correct. They refer in the annual report both to annual figures that are available and fiscal year figures. I would have to review the document to determine whether, just what the precise period they are referring to.

Q. Now, the preceding annual report which covered the year fiscal year ending June 30, 1965, also spoke about the alarming increase in train accidents, did it not? A. Well, they probably referred to the increase in train accidents, I can't remember whether they used the adjective "alarming" or not.

Q. Now, in making up these charts, these charts are made up under your supervision? [360] A. Yes, sir.

Q. By employees under your supervision, I assume. Is that correct? A. Yes.

Q. Did you assist them in the selection of the statistics which they used? A. Oh, yes, it is not a selection of statistics here. It is, in that the material comes right out of the reports published by the Interstate Commerce Commission. I specified and set up the charts, schematic form, and I took off many of the figures myself, and I had help in taking off some of the other figures.

Q. Didn't you deliberately select certain statistics which would be helpful to the railroads, the plaintiffs' position in this case? A. I selected the statistics which I thought would be the most helpful in determining the facts. That is, I first dealt with train accidents, and then I dealt with the casualty picture. I confined my statistics generally to train and train service accidents. And I used the broadest scope of coverage that I could get in each instance.

Q. Was it any factor at all the selections you made at any point in these statistics what would be helpful to the position of the railroads in this case? [361] A. Oh, yes.

Q. All right. You have testified in, I think you said yesterday, you said numerous proceedings involving railroad safety statistics, haven't you, Mr. Greer? A. Many cases, yes.

Q. Have you on those occasions also selected statistics which would favor the railroad's position about the size of crews? A. It depends on what connotation you mean by the word "selected." I have presented to several bodies the data that is published by the Interstate Commerce Commission, and I have attempted to correlate it and summarize it and present it in the form that would be workable and useful to the tribunals that were using the material.

Q. Do you recall testifying before a Senate Committee which was investigating the effect of Arbitration Award 282? A. Yes, sir.

Q. When were those hearings held? When did you testify? A. I believe it was in September of 1965.

Q. You presented at that time material very similar to what you have presented here, except you now have a longer period of experience to draw from. Is that correct? A. That is correct.

Q. I want to read you five or six lines from that proceding in your testimony and ask you if this relates to your [362] selection of materials which will most assist the railroad's position, in that and this proceeding. Senator Cannon, I think, from Nevada was asking you questions, and Senator Cannon on page 652 of the hearings in the railroad work rules dispute on the date which you have indicated, Senator Cannon says "Why didn't you use the same mileage figure the ICC uses? Mr. Greer: We do use freight miles. Senator Cannon: But you made up your own set of figures. You revised it according to your chart here. Mr. Greer: Yes. Senator Cannon: Why did you revise it? Mr. Greer: Because the ICC figures were more favorable to the—let's put it this way—— Senator Cannon: More favorable to whom?" And then you have a long answer which I won't put in the record here. Now, do you mean they were more favorable to, for example, the railroad unions or to some position other than the railroads? A. Do you want me to answer that in the abstract or do you want to know the facts? Q. I don't know what your question means, Mr. Greer. I would like to know if this relates to the point we have just been talking about, namely, that you selected statistics which would be most favorable to the position of the railroads concerning accident and crew consist data. A. I have examined the statistics and where I find that there [363] are errors in the compilation of them by the Interstate Commerce Commission or any other body that would distort the true picture, then I have corrected those errors to the best of my ability. And that is the type of things that was involved in the question of Senator Cannon. The

ICC changed its instructions in the year 1961 with respect to the reporting of locomotive miles. The instructions that the ICC issued were not clear. The railroads reported erroneously the wrong type of miles. The ICC assembled them and the results were distorting. I went to the ICC, explained the problem, they agreed that the figures were in error, and I corrected them. They approved the corrections.

Q. The reference in the Senate transcript to more favorable to, what was that? A. That was—the record in that transcript was this. That the figures that were published by the ICC showed a, the uncorrected figures showed a decline in the locomotive and motor trains miles between 1961 and 1964 with the result that the frequency ratio resulting from the use of that measure of exposure would have been distorted, when in fact the train miles increased over that period.

Mr. Lucente: May I object. Mr. Youngdahl stopped his quotation from the Senate hearing at the point that Senator Cannon asked a question. He is now interrogating [364] Mr. Greer about what the response to Senator Cannon's question should have been or was, when in fact the very next line of the report indicates Mr. Greer's response to the question. If he intends to persist in examining Mr. Greer on what the import of Senator Cannon's question was, then I believe in fairness to Mr. Greer that the answer which Mr. Greer made in response to that question should be read into the record, and Mr. Greer should be given an opportunity to look at it.

Judge Van Oosterhout: He can have the matter, refresh his memory as to what he testified. But as far as getting more in the record, you can take care of that in redirect.

Mr. Youngdahl: I have no more questions along this line.

Judge Van Oosterhout: Your objection will be overruled, except if they are to be pursued he can refresh his recol-

lection from the books. If you want to bring in anymore that hasn't been brought in, you can make it out on redirect.

Q. One more question in the area of your process of selecting statistics. On any of these charts, Mr. Greer, did you omit years or periods of time or factual comparisons because those particular elements would have favored the Intervenors and the State's position in this case? A. No, sir.

Q. Yesterday, Mr. Greer, you used the term "exposure." Is [365] that a recognized statistical term? A. Oh, I think so.

Q. What does it mean? A. In the terms that I used it yesterday, exposure measured by some unit, more probably reflects the actual operations of the railroad, not necessarily the railroad, but the bus lines, the air lines, whatever transportation industry you are measuring exposure to. And I used it in terms of the unit locomotive and motor train unit miles, I believe, yesterday as being the best measure of exposure to train accidents and to the casualties that result in train and train service accidents. I also used several other exposures.

Q. You used locomotive and motor train miles, gross ton miles, car miles. Anything else that you used exposure factor? A. The other——

Q. Are there other exposure factors? Do you use any other in your charts? A. I believe that is it.

Q. Let's stay away for a moment from the particular railroading aspect and ask you as a statistical term or concept, what does exposure mean? A. It means the period of a measure of the operation. You have to be specific to get to the point. In respect to train miles, it represents the number of units of yard [366] switching locomotives, local freight trains and passenger trains that are run on the railroad. In the terms of some other measure, it would mean some other basis of exposure.

Q. Are you able to give us any definition in a general

sense that is not related particularly to train miles or anything of that sort? A. Not——

Q. As a statistical term what does it mean? A. I don't think I can do anymore than I did there.

Q. Let me see if I can try. Would exposure be a concept which you compare one period to another about something happening, that it shows the possibility of something happening, as compared with how many times it happened. Is that getting close to it? A. Yes. That would be a basis for explaining it.

Q. Now as to casualties on trains. I am speaking of train accidents and train service accidents or any other kind of accidents involving railroads. Is hours of service, total hours of employees' service a legitimate exposure factor? A. Legitimate, yes.

Q. You didn't use it in any of your charts? A. No.

[367] Q. Is that correct? A. That is right.

Q. It is in fact the standard factor which is used to measure casualties in most statistical analysis, is it not? A. In a great many statistical analysis, yes. Not all and not even most.

Q. Can you explain to us why you didn't use it? A. Yes, there are several reasons why, in these terms. Insofar as measuring total casualties to persons of all classes there is, of course, no basis for any man hours that would even hit the mark at all. And the basis of measuring casualties to employees on duty involved in train and train service accidents there is no appropriate manner or basis with which to cover and provide an appropriate basis, concept as you call it, for measuring accident exposure. Because in addition the train and engineer service employees that are injured in train and train service accidents, there are other classes of employees. Some whose work is directly connected with yard operations and some who don't get near a train or a locomotive, but maybe once a week or once a year, but if they happen to be on duty they are, and are hurt in a train service accident,

they are classified as employees on duty. So there isn't any appropriate measure there. Then getting down to engine and train service employees [368] on duty, since 1964, of course, as you say there has been brought out, a substantial decline in the number of firemen employed on the American railroads, and we are talking here in terms of a composite casualty rate. We are not dealing here in this exhibit with the casualty rate for any specific class of employee. It has been streamlined and compressed to the total casualty rates. And if, as the facts are, firemen experience injuries and casualties in train and train service accident at a much lesser rate measured in terms of man hours or train miles or any other exposure rate than other classes of operating employees, and you remove over half of the firemen's hours without any change whatever in the accident frequency rate, whether they are measured in terms of miles or hours or any other exposure, the composite rate would automatically go up. For example, the conductor, the road conductor, the road brakeman in local freight service, in yard, casualty rate are four to six times as high as they are for firemen. And you remove half of the hours and all of those accidents that occur to the firemen that are not on the trains, the composite rates automatically will go up. So that over this period of time there has been a substantial change in the employment among the train and engine service employees, and for that reason a casualty rate based on man hours would distort the true picture.

[369] Q. The fact is, Mr. Greer, that if you had used man hours, the casualty rate rather than being shown to decline as your document computed in terms of million gross tons and things of that kind, the casualty rate would be going up substantially in the same way that accident rates are going up. Isn't that correct? A. Not substantially, no, sir.

Q. Would it be going up some? A. Well, it depends on what data you are talking about and what period of time.

The latest published data of the Interstate Commerce Commission is for the year 1965. It shows the casualty rate by classes of employers. And between 1963 and 1965 on the basis of the data published by the ICC, there is a moderate upward trend in the casualty rate on a composite basis. But if you give appropriate recognition to the decline in firemen's hours, that is moderate. I think two or three per cent increase, becomes a decrease. And on the basis of the individual classes which does not involve this composite in the absence of the firemen's hours, some of the classes have gone up and some have gone down, but on the average the performance in terms of train and train service accidents, casualties engine and train service employees is very minor change.

Q. Accepting what I understand to be your theory, if I do understand it, as to why you didn't take man hours as [370] being related to the fact that the composition of a crew changed when some people whose accidents rates, casualty rates tend to be less than others on the crew were dropped out, why didn't you in the face of the fact that man hours is the usual exposure factor, why didn't you put that in one of your charts with an explanation or an adjustment to account for the dropping of firemen off the crews? A. Because I didn't think it appropriate in these terms. It just is fundamental here, for example, dealing with units of operation that if you have, you operate a hundred trains a day, and you have a crew size of five, and you use man hours as a basis, and suddenly you have a crew size of three, or only sixty per cent of the former crew size, and you have no increase in train accidents or train service accidents, no additional people are getting hurt, and you divide it by man hours, your rates would have gone up forty per cent. It is so fundamental that I didn't think it appropriate to burden the record with that kind of material.

Q. Do you think it is appropriate to burden a record

that shows human casualties in terms of billions of tons of freight as an exposure factor? A. Yes, sir.

[371] Q. It is true, isn't it, I suppose, we, all the records already establish the trains are much longer than they used to be. That is correct, isn't it? A. Yes, on the average.

Q. The cars are much bigger than they used to be, much longer? A. Yes.

Q. And the capacity is much higher? A. Yes.

Q. And the ton per human being on the crew has just soared, especially in recent years since World War II. Isn't that correct? A. Well, there has been an increase, yes.

Q. Substantial increase? A. Yes. Remember now, we are not talking in terms of humanity here. We are talking about in terms of an exposure that probably takes into account all of the factors of train operation.

Q. I understand how billion gross ton miles would be a good exposure factor for seeing how much damage there was to cargo, but I cannot see, since human being now is responsible for many more gross tons than he used to be, why it isn't an appropriate exposure factor for casualties. Do you have anything further to say in that connection? A. Well, I think if you would look back into the records of [372] the Interstate Commerce Commission you would find that many years ago they published exposure on the basis of gross ton miles. It is not the only measure, but it is a measure that combines both the increasing business in terms of train miles, or the decreasing business in terms of train miles, and the length and weight of the train.

Q. I would like for you to be a little more specific on that Mr. Greer. Would you tell us when and where there was ever before, outside of your charts, been published a casualty record for railroads in terms of gross ton miles? A. I believe in the twenty-five, thirty-five series of annual accident bulletins of the Interstate Commerce Commission.

Q. Since 1935 was the last time that you can recall? A. That is the specific type of comparison.

Q. Now, you are speaking of the year twenty-five to thirty-five, does that mean 1925 to 1935? A. Yes. I said during that period. I wouldn't say that it was in every one of the accident bulletins. It has been some time since I looked at those accident bulletins, but in at least some of those between that period there was a comparison like that.

Q. Since 1935, do you know of any published place or [373] anybody who purports to be a statistical authority who has measured casualties by billion gross ton miles, except you? A. You are talking about the casualty side, now?

Q. Yes, sir, I am talking about the casualty side. A. No, I don't know of anybody.

Q. Are you familiar with the Bureau of Labor Statistics Handbook of Methods for Surveys and Studies? A. Yes, to a certain degree.

Q. I am going to read you three or four sentences from there and ask you if you agree with this. This is the edition published in October, 1966. Have you seen that document or one prior to that? A. Yes.

Q. It is headed Injuries Frequency Rate. Would you please listen and see if you agree with this concept, or these sentences. "Injury Frequency rates are the primary measures of the incident to work injury. They indicate the relative level of injury occurrence prevailing in different establishments, operations or industries during a specified period of time, and provide a means of determining trends in injury occurrence for a progress and accident prevention." Note this next part I would like for you to concentrate on, if you would. "A standard injury frequency rate is defined as the average number of disabling work injuries for each [374] million employee hours worked. The lack of comparability inherent in simple injury totals

arising from variations in employment and operating time, is thus overcome by expressing the injuries in terms of a standard unit of exposure." Do you agree with that? A. In the terms in which they are using it, yes, because there they are talking about making comparisons between one type of industry and another; they are talking about comparing injuries in the automobile industry with those in lumber mills and sawmills. For the purpose here, and as is published by the Interstate Commerce Commission, the best measure and the most appropriate under the context of this document that I presented is an exposure that is related to miles, train miles, and to a certain gross ton miles, particularly with respect to the train accident rate. With respect to casualty rates, there isn't any appropriate way to measure the casualties to the public, at grade crossing, to trespassers, to passengers on trains, and to total employees on duty except some measure of railroad operation. Not man hours. There is no man hours that would fit the picture.

Q. It seems to me that I recall in some of your charts, and we will get to the specifics later, but generally for the moment, in some of your charts that you do isolate a train [375] crew employee as to casualty, do you not? A. Yes, sir.

Q. In those instances, you have got the public out of the way for the moment, and we have got everything except the crew on the train. You can't tell who the crew on the train is, and what casualties they have. Would it not be most appropriate to measure their casualty frequency or exposure in terms of man hours? A. If you were doing it on an individual craft basis. For instance, engineers comparisons with engineers in a prior year, or firemen comparisons with firemen in a prior year, yes. But to put the entire group of train engine and service employees together and then get a composite man hour rate is deceptive for the reason that I earlier explained.

Q. Can you conceive of any situation in which the ab-

sence of a fireman would contribute to unsafe conditions on the part of other members of the crew? A. I think if you thought hard enough you could conceive of a situation, yes.

Q. Can you conceive of a situation in which two brakemen as opposed to three brakemen would increase the danger of injuries to the other members of the train and engine crew? A. Would increase the danger?

[376] Q. Yes. A. Yes, I can think of that type of situation.

Q. Now, I would like to discuss some of the things we have been discussing in relation to your specific charts. I see you have Plaintiffs' Exhibit 109 in front of you. I do have one more introductory thing. Does the National Safety Council also collect statistics of injuries in industry in terms of man hours rather than in terms of some other unit of exposure? A. Yes, they publish both type of comparisons. The National Safety Council publishes transportation data based on passenger miles for buses, airlines and railroads. And then they also publish data based on man hours for various industries.

Q. Would you look at the table on page 1, if you please. In column number 4 the top half of the column, you note that the total casualties in train accidents has been in 1965 and 1966 under what it had been in previous years. A. Yes, these are the twelve months ending August 31.

Q. Oh, yes. A. These are fiscal years based on the latest published data that is available from the Interstate Commerce Commission.

[377] Q. When you say fiscal year you are talking about a different concept of the ICC uses in its annual report, aren't you? Their fiscal year ends June 30. Is it a different kind of fiscal year? A. Well, it is a different period. It is the same kind.

Q. What does fiscal year mean? A. It just means something other than a calendar year in the terms that I have used it.

Q. When you use fiscal year, that is what you mean? A. Yes. In other words, the data for August, 1966, is the latest data available. If September had been available, I would have used the annual periods ending with September.

Q. While we are on the selection of dates, why isn't 1961 included on the table on page 1? A. Part of 1961 is included. I wanted a five year period, and this includes the twelve months ending August 31, so it includes the last four months of 1961.

Q. Was it a standard approach to all these charts that you selected a five year period? A. Yes.

Q. Now, again going back to 1965 and 1966 figures in column number 4, which shows a total casualty in train accident figure, which are both less than the preceding three years. A. Yes, sir.

[378] Q. I call your attention to that. You see what I am talking about? A. Yes.

Q. Now, isn't that total casualty decline in those two years accounted for in part by the fact that it includes passengers, and railroad passengers have declined substantially during those two years? A. Well, yes, part of the passenger business is in there.

Q. Isn't it also true that the decline is attributable in part to the fact that it includes train employees, railroad employees who service or deal with passenger service which has been declining during those two years? A. Yes.

Q. Isn't it also true that the decline is in part attributable to the fact that railroad employment general—operating crews, because of facts we have already talked about, and non-operating crews—have declined substantially during those two periods, those two years? A. There has been a decline in employment. At the same time there has been an actual increase in the terms of trains operated. And when we go to the rate, we see that.

Q. The total number of employees in 1956—excuse me, 1965 and 1966 were substantially less than the total num-

ber of employees of the railroad in 1962 to 1964. Isn't that correct? [379] A. Not substantially. It depends on again what you mean by substantially.

Q. Has it gone down year by year? A. Yes, there has been a moderate decline between 1964 and 1966.

Q. And we have talked about this in relation to the train crew and the engine crew, but isn't that also true as to maintenance of way employees and other employees of the railroads who are not operating crew members? A. That is right.

Q. What is the point, Mr. Greer, in columns 6 and 7 on page 1 of having a category which excepts grade crossing accidents? A. Well, as you can see the number of casualties in grade crossing accidents are substantial, by the difference between the columns 4 and 6. Now, at the same time over this period there has been a moderate increase in train miles. There has also been a very substantial increase in automobile registrations and automobile miles. And as the Interstate Commerce Commission and other authorities have said in many studies that they have conducted and many publicity campaigns that they have contributed to, that the great majority of grade crossing accidents that occur are beyond the capability of the engine crew to [380] eliminate. The car drives up onto the crossing in advance of trains, in most situations that the train crew can do about it. I thought it would be helpful to separate out those types of train accidents and to show the decline both ways. These are train accidents, and these are collisions at highway grade crossings that result in more than $750 damage to the railroad property. That is the reason for the breakdown.

Q. I take it by that that you will agree that in some instances the performance of the crew, the train crew and the engine crew, will contribute to avoiding grade crossing accidents? A. Oh, yes.

Q. For example, the availability of members of the crew to keep a lookout and so on? A. Yes.

Q. So to some degree grade crossing accidents are affected by the reduction in the size of the crew that has taken place, particularly in terms of these years in 1965 and 1966? A. Well, now, that goes further than I thought your other question.

Q. It does, but I am asking you that. A. The answer to that is I have no evidence that is true. I think that a two-man lookout in road freight service [381] is effective in 99% of the cases as a third-man lookout would be. And in the type of accidents that occur in yard service around grade crossings, I think that an adequate placement of the ground crews and an alert engineer are adequate to prevent grade crossing accidents. But to say that under no circumstances would the lookout of an additional man might avoid an accident, you couldn't say that. But there is nothing certain about casualties and accidents occurring, except some of them will occur.

Q. Would your answer as to the function of the lookout responsibility on the part of the crew members be the same for freight and for passenger trains? A. Yes.

Q. Turn to column 8 on page 1. There actually is a very inadequate coordination, if I understand it correctly, between the percentages in column 8 and the previous columns because column 8 relates only to freight and yard service whereas the previous columns refer to much more than that. Isn't that correct? A. Well, yes, they refer to much more, but I wouldn't characterize it as a completely inadequate comparison, because the freight and yard operations constitute such a large proportion of the railroad's business in the United States that a 52% decline in the number of [382] firemen in freight and yard service is a large decline in terms of the overall business of the American railroads. The table on page 5 of this exhibit would illustrate, I believe, that.

Q. Let's just stay with page 1 unless you want to go ahead. A. No, I am sorry.

Q. One more question, I think, about page 1. You

spoke this morning and yesterday, too, I think, of the change in reporting requirements of the ICC concerning the concept of locomotive and motor train miles. When did the reporting requirements change in that respect, or when were they clarified in that respect? A. Well, there was really no change in the concept. There was a change in the execution of the instructions brought about by the changes in the basic operating statistics.

Q. When? A. 1961, I believe. It might have been 1962, but I think it was 1961. The operating statistics were changed so that the railroads were no longer required to report locomotive miles as such, but were relieved of that obligation and report on a locomotive unit mile.

Q. That change occurred sometime during the period represented by those years on page 1, did it not? A. Yes, sir.

Q. Became effective, at least, during that period? [383] A. Yes, sir.

Q. So there is some problem in comparing the early years of that period with the late years of that period because all the figures in the bottom half of that exhibit are dependent upon locomotive and motor train miles? A. There would have been a problem. That is the problem to which I was referring in your earlier cross-examination, but in conjunction with the Commission, I have gone back and corrected the previously reported locomotive and motor train miles to make them conform in concept and actuality to the present basis of reporting. So that these rates are calculated on the basis of the adjusted locomotive and motor train miles as was thoroughly explained in appendix 1 to my exhibit to the Senate Committee.

Q. Let me ask a little further about that change. As I understand it, before 1962 or whenever it was some railroads reported locomotive train miles whereas some railroads reported locomotive unit miles. A. That is correct.

Q. Is that correct? A. Yes.

Q. And at the time of the change the Commission made it clear to the carriers that from then on they were to report locomotive train miles and not divide up their [384] mileage, depending on how many diesel units they have? A. Yes, sir.

Q. And as a result of that change, depending upon how the particular railroad had done it before—and there was all kinds of variations—as a result of that change some railroad miles dropped substantially from the period just before the change to the period just after the change. Isn't that correct? A. Yes.

Q. Now, as I understand what you have just done to compensate for this is that you have made a broad industry-wide adjustment based upon figures applying to all railroads. Is that correct? A. Well, that is true with respect to this material. Later on in the exhibit, with respect to the sixty-seven railroads, I have adjusted it on an individual railroad basis, based on their operating statistics report to the Interstate Commerce Commission.

Q. We will get to that. Does the Bureau of Safety and Service of the Interstate Commerce Commission collect statistics on employment and man hours? A. Not directly. They get their man-hour statistics from the wage material. They do collect the data on the train miles, locomotive and motor train miles.

[385] Q. They do not collect on man hours? A. No, the man hours are derived from the ICC statement M-300 collected by another section of the Commission.

Q. Would you please turn to page 2 of your exhibit. Now, here is the first appearance of the billion gross ton-miles that we talked about in a general way before. And I don't guess we have to go into it again. The entire exhibit on page 2 is computed in terms of gross ton-miles. Is that correct? A. Yes, the accident figures as stated in the footnote are the accident data for all railroads, and the gross ton-miles is the data for the Class 1 line-haul

railroads, and the train accidents are divided on this table by the gross ton-miles, whereas on the preceding table they were divided by the train miles.

Q. Now here you begin in 1961. What is the reason for that, Mr. Greer? A. Well, there again, this specific material in this form was presented in earlier cases and it starts with the year 1961 by quarters, and I simply added the later data.

Q. Why did you select 1961 for the purpose of this case? Where you have 1962, August 30, in the table before. A. I didn't select it for the purpose of this case. I just said that this table was merely extended from a previous [386] table submitted earlier to other tribunals.

Q. Why did you originally select 1961 as the starting point? A. Because it was at that time that the currently effective ICC reporting regulations were last changed.

Q. And it is clear that in relation to billion gross ton-miles which is the exposure factor for the entire table 2 that the gross ton miles per employee have increased substantially in the period covered by this table. Isn't that correct? A. Yes.

Q. And the gross ton miles per train have increased substantially during the period covered by this table? A. Yes.

Q. Would you now turn to the table on page 3. As I understand what you are trying to tell us about this one, Mr. Greer, is that in relation to the $750 standard for reporting accidents, you are saying that that standard makes later accidents tend to more reportable than earlier accidents because of the increase in those particular kind of things which you show on the chart. Is that correct? A. Yes.

Q. I assume you are trying to say by this that the cost of $750 in 1961 might cost $750 in 1966 because of certain inflationary factors? A. Yes, $751.

[387] Q. And therefore what appears in the figures of train accidents to be an alarming increase, according to

the ICC, or a substantial increase in your terms, is really not so substantial or alarming because of this inflationary effect on the report? A. That is only one element, and it——

Q. This table involves that? A. Yes.

Q. Now, Mr. Greer, where on this table does it indicate, if any place, how many hours people spend in repairing locomotives or rolling stock or things that are damaged in train accidents? A. It does not appear.

Q. Where on this chart does it reflect the automation and the improvement in repair equipment which has been put into effect during the duration of this chart? A. It is not reflected.

Q. Wouldn't it be a far better statistic in terms of showing the inflationary effect to have unit costs for repairs rather than the hourly wages of the people who are engaged in the repair? A. If unit costs were available consigned to repair equipment involved in train accidents, that might be a fine figure. But it isn't available and the mere unit cost of overall repairs would not truly reflect the type of inflation [388] the type of costs that I think are inherent in the period covered by this table. Thus, I am talking now about the difference between, for example, repairing a car involved in a minor derailment. That is taking an ordinary friction-type bearing boxcar. It is derailed. The brasses are damaged, and maybe they have to change the brasses and take it down and maybe change the axle out. Now let's take that same minor derailment involving one of the newer cars equipped with roller bearings. Unit costs wouldn't reflect the difference between the cost of tearing down a roller bearing and finding whether anything was wrong, but merely finding that the roller bearing was operative and replacing it would cost practically $750. And that is the type of inflation that I am talking about. Not the unit cost inflation.

Q. Isn't exactly the same infirmity present in talking

about maintenance of way employee wages generally. Don't they do a whole lot of different things besides repair trains that are involved in the train accident category? A. Oh, yes. But to the extent that they spend an hour repairing a train damaged in a train accident and seven hours working on other projects, their rate of pay is the same, and if it has gone up it has had a tendency to increase the cost of repairing equipment involved in train accidents.

[389] Q. My point is, what I mean to ask you is your explanation of why unit costs would be inadequate is that a unit cost would reflect so many more things, so many more kinds of services other than repairing $750 train accident situations, isn't it also true that the hourly wage reflects so many more kinds of functions by those employees? A. Well, it has the same characteristics, yes.

Q. And therefore wouldn't a unit cost—they both have the same infirmity, but wouldn't a unit cost that would show automation and the number of man hours required which contracted during this period, wouldn't it be a better measure of its effect on the $750 accident reporting statistics? A. No, sir, I don't think it would, for the reasons that I explained in connection with the bearings. This, of course, is not intended to be, and I never said that it was a precise measure. This is just an indication of the fact that over this period the $750 dividing line has remained constant during a period when costs of equipment and wages and equipment are going up.

Q. I am not sure that you agreed with me in the sense of establishing the fact. It is true, is it not, that repairs have been automated during this period represented by the chart on page 3? [390] A. Well, it is true in isolated cases, but there again you are talking in a broad term. What do you mean by repairs automated?

Q. Well, we concede that it is true that there are fewer man hours on an overall basis, fewer man hours required to repair equipment, the same effect or problem

of the equipment in 1966 then there were in 1961? A. Well, if you mean that there are fewer man hours of shop employment in relation to the business being handled, I would agree. But whether or not that means that the same item of repair is being done at a much faster pace because of this automation, then you are getting into a field which has many variables, and part of this decline in shop employment, while business has held up fairly well, may be the fact that the carriers are investing, as they are, billions, millions of dollars a year in new freight equipment and retiring the older equipment so that in the overall, for example, in terms of cars there is not as much repair necessary. The cars are new. They are in better condition. But if you put one of those cars through a derailment and it is damaged, that cost is bound to be considerably more than the cost of repairing a thirty year old boxcar in the same derailment.

Q. All right, fine. Let's get to that, which also involves [391] the bottom part of the chart on page 3, the average cost of new units going up. Isn't it true that as older rolling stock and equipment of the railroad is replaced by new things, that this has a favorable effect on safety? A. In a general term, yes.

Q. So while it may affect the $750 cost when you have to replace a torn up car, old car with a brand new car, it also will have an effect the other way. That is, on the whole accident reporting situation in that it will make an accident less likely to happen? A. That is true.

Q. And don't those two factors compensate for each other at least? A. Well, it is possible that they compensate for each other, but certainly we have no basis to determine that in a single situation or many situations that the compensation detracts from this statement, and I wouldn't agree with you there. The purpose of this statement is to show exactly what I have said, and there is no use saying it again. But to generalize to say that

one will compensate the other, we have no basis for measuring that type of thing.

Q. I am not arguing with your dollars at all or any of your figures in that sense, or not if you are inaccurate. [392] I am just talking about their meaning.

* * * *

Q. One more question in regard to page 3 of the table we were discussing prior to recess. The categories of employees, maintenance of way and maintenance of equipment that are referred to at the top of that page. There have been during the period 1961 to 1966 represented by this chart a substantial decline in employees in those classifications. Isn't that correct? A. Yes, there has been a decline.

Q. Now going to page 4. Here, Mr. Greer, I understand you selected to begin at the first of the calendar year 1961. Is that correct? A. Well, this is the only data that is available for this [393] type of table. It is contained in the annual accident bulletin of the ICC, and this is for the calendar year 1961 through 1964.

Q. Aren't train accident rates available for 1965 as distinguished from the casualties rates in the bottom half of the chart? A. In gross, but not by classes of service.

Q. Here again as to casualty rates you use the per million locomotive and motor train mile figure. There is no way from this chart either, I presume, to compute the hourly exposure factor. Is that correct? A. No, sir, not from this chart.

Q. On that general proposition I came on a document at recess. I think you said you use to work for the Bureau of Railway Economics for the Association of American Railroads? A. Yes, sir.

Q. And they published a document called Railroad Transportation a statistical record 1921 to 1963? A. Yes, sir.

Q. And there was one chart relating to casualties in

that booklet and it is divided between passengers on trains and employees on duty. Are you familiar with that? A. I have a recollection of it, yes.

Q. And the only exposure factor used in the railroad's document [394] I just described as to employees on duty is man hours worked. A. In that particular tabulation, I believe that is so.

Q. Now turn to page 5, if you please. Here, as I understand it, you use three exposure factors—train miles, gross ton miles, and net ton miles. Is that correct? A. I have not used these statistically as exposure of measure. The purpose of this table is to show the differential changes in passenger, freight and yard operations.

Q. Well taken. They are not used as exposure factors in this connection, I will have to agree with you on that. Why in this chart did you begin with 1961 and end with 1965. I take it here it is a calendar year January 1 through December 31. A. That is right.

Q. Why did you do that? A. Because these statistics are available in the form here only in the Interstate Commerce Commission statistics of railways. Now you can get later data for 1966 on a partial year basis, but I wanted to show this on an annual basis, and for that reason the data for the year 1966 is still preliminary, or was at the time this table was prepared. So I did not add the year 1966.

Q. On other tables you have chosen to use a partial year [395] even though the rest of the computations are by a year as a whole. A. Only with respect to the casualty and accident data specifically published by the ICC in its statement M-400, and the purpose there was to give to the Court the latest available data on train and train service casualty and accident statistics.

Q. Would it be fair to say about the chart on page 5 that what it shows is that in spite of consistent and substantial decreases in passenger mileage the aggregate number of train accidents having increased greatly during

this period, that it emphasizes the increase in train accidents in freight and yard service mileage? A. Of course, the accident data is not on this table.

Q. No, but we know about that otherwise. A. What this does show that there has been a decline in passenger traffic, whether measured in train miles or otherwise, at the same time that there has been an increase in freight service to a fairly substantial degree, and a somewhat smaller increase in total yard service. The yard service, of course, the yard locomotive miles here reflects the servicing of both passenger and freight trains. As I—to that extent, that is what this table shows. The other conclusions you have drawn, do [396] you want me to comment on them.

Q. Well, let's start maybe with a couple of preliminary facts. We have agreed there has been a substantial increase in train accidents in this same period? A. Yes, sir.

Q. And what this table emphasizes is that increase has been concentrated in freight and yard service, because passenger service has substantially declined? A. This table doesn't show that point at all.

Q. This table plus the total train accident figures that we already know about. A. Yes. Now, the point that I made here is this, that because inherently and for many, many years there has been a differential in terms of accident frequency as between, train accident frequency as between passenger trains and freight trains and yard operations. That the shifting of this composite traffic would result in an increase in and of itself in the total number of accidents. Now I don't say that that accounts for the entire increase. I simply say that it has contributed to the increase. And that is the point of the table.

Q. I am satisfied. Let's turn to page 6. Now, columns 4 and 5 relate to casualties in non-train accidents on your chart. Would you agree with me, Mr. Greer, that casualties [397] in non-train accidents are less likely to be re-

lated to the issues in this case. That is, to the effect of crew consist on accidents, than casualties in train and train service accidents? A. Yes. In fact, there isn't any connection at all, or if it is it is most remote.

Q. So isn't it true that the same point applies here that applied on the passenger against freight comparisons. That fact is that accidents in—casualties in non-train accidents have been declining more than your figures show casualties in train and train service accidents have been declining. Isn't that correct? A. Yes, over this period there are differential changes in the various years, but——

Q. Over the period? A. Over the period there has been a somewhat greater decline in non-train accidents.

Q. And therefore in the kind of accidents that are related to the consist of crews, there has been a greater increase in casualties or at least a less decline in casualties than in accidents that are unrelated to consist of crews? A. There hasn't been an increase at all between, for example, 1961 and 1965. There has been a decline, a lesser decline.

Q. I modified that, right. And perhaps you had better recall, doesn't it apply here that the total number of employees [398] who are subject to train and non—and train service accidents has declined substantially from 1961 to 1965? A. There has been a decline, yes.

Q. For the reasons that we talked about—Arbitration Board 282 Award in firemen and the local awards on train crew and so on. Right? A. Yes.

Q. And also other kinds of railroad employees that are not operating employees. Correct? A. There has been a decline in employment of varying degrees in the various classes.

Q. During the period we are dealing with here? A. Yes.

Q. And also that there are fewer passengers, and this list includes passengers. Correct? A. Yes, this includes persons of all classes.

Q. And are there also fewer people operating passenger service because passenger service has gone down during this period? A. Yes, sir.

Q. Why was it, Mr. Greer, you chose here to include the first eight months of 1966, a portion of the year, although the rest of it appears to be on an annual calendar basis? A. Because here again I wanted to give the latest figures that were available. And this table in this present form appeared in similar tables presented to other tribunals, and I simply [399] added the first eight months of 1966 and compared it with the first eight months of 1965.

Q. Why did you begin with 1961? A. For the same reason that I began with 1961 on the other tables. The casualty definitions here would make the figures noncomparable back of 1961. 1961 was the year when the casualty definition for employees changed from 72 hours to 24 hours.

Q. Referring to column 8 on page 6, the percentage of freight and yard operations without firemen. That figure actually doesn't directly correlate with any of the other columns on the list, does it, in that they all include things in a far greater classification than freight and yard operations? A. No. I would say that column 8 corresponds fairly closely with columns 2 and 3, which are confined to train and train service accidents. The freight and yard operations bear such a large percentage of the total operation of the railroad that this is a fairly close representation of the extent of the total operations conducted without firemen.

Q. Does column 8 have anything to do with columns 4 and 5? A. No, sir.

Q. In fact, passenger firemen are still on trains insofar as passenger service is represented in columns 2 through [400] 7. Isn't that correct? A. Yes, sir.

Q. Would you please turn to page 7. It is just my general impression now, and I would like to have you correct me if I am wrong, (strike)—The comment that you made

in connection with my questions on the chart on page 6 are equally applicable to the chart on page 7. Isn't that correct? A. Well, if you mean the comments with respect to non-train accidents not being related to the operations of trains and locomotives, I would say yes. I can't recall all of the other discussions.

Q. Well, we will just quickly go over some of them. Particularly columns 2, 3, 6 and 7 the casualties are going to be reduced by the fact that passenger service is going down, the total employees are going down, that employees in operating crews are going down, that employees on passenger trains are going down, et cetera. A. That, of course has had some effect; an offsetting effect has been the increase in the number of train miles operated. So that we have more of the units of operation with more cars finding hazards involved and a decline in the absolute number of casualties, and as we see on the following pages, a decline in the rate measured in terms of train miles.

[401] Q. In the face of that offset, which I can see your point about, does that indicate to you that the most accurate way of measuring exposure is by man hours. Doesn't that offset itself reveal that to you? A. No, sir, not in terms of a composite rate. It does just the opposite.

Q. Now, will you go to page 8, please. Now here you have a twelve month period ending August 31 again. Why did you select that for this table? A. Because this particular table was prepared on the basis of the, originally prepared on the basis of the August, 1966, M-400, which includes the cumulative figures for the eight months. And I wanted to get a full year comparison on this because I have expressed it in terms of rates on page 9, and I didn't want to have a varying period. I wanted a constant twelve months period with which to make these comparisons. If the data for the full year of 1966 were available that would have been what I would have used. If it had been September only, I would have used the annual period ending in September.

Q. Insofar as the present firemen on freight and yard operations is concerned, 1964 even as you have selected it ending August 31, was a mixed year. Isn't that correct? That is the arbitration Award 282 was in effect part of the year and [402] not in effect the other part of the year? A. Yes, insofar as firemen are concerned it became effective May 7, 1964.

Q. So if you strike out in the top number of casualties including fatalities, which seems to be the more pervasive casualty figure here, if you strike out the middle year, 1964, which was a mixed year in terms of the presence of firemen, it appears to me that there were more casualties during on an average during 1965-1966 than there were in 1962-63, the contrasting periods in which firemen were present 1962-63, which the time during the whole year tended to be absent 1965-66. Is that fair to say that from your figures here? A. Well, looking in column 2 we find that 20,124 casualties occurred in 1962, 19,515 in 1963. Now, 1965, 20,250, which is slightly above 1962, and 19,744, which is below 1962 but slightly above 1963.

Q. Isn't it clear, take, I think, any one of two of columns 2, 3 and 4, referring to the total number of casualties, which is the first group of figures, that the 1962-63 average is lower than the 1965-66 average in all three of those columns? A. Slightly, yes. I see no point in combining years like 1962 and 1963 into a single average. The data here is designed to show that there are changes from year to year, [403] that those changes occurred before the effective date of Arbitration Award 282 and after Award 282.

Q. You on many occasions have combined years in these various charts, haven't you? A. I don't know of any that I have combined in these charts.

Q. Well, I think that is easy for me to find. Let's look on page 11 just quickly to show you what I mean. The bottom box you have got all kinds of comparisons—1962

to 1963, 1963 to 1964, 1964 to 1965, 1965 to 1966, which are all yearly ones, and then you have 1962 to 1966 and 1964 to 1966. You have on those occasions combined years, haven't you? A. Those are not a combination of years. That shows the percentage increase from a single year 1962 to a single year 1966.

Q. Perhaps the difficulty was because of my using the word "combination." You have on many occasions in these charts taken periods of longer than a year when they suited your particular purpose to produce figures. Isn't that correct? A. I have taken comparisons when they seemed relevant to the situation. Not to suit my particular purpose.

Q. Now, the terms of the man hour question factor of exposure, and again back on page 8, occurring 1962 to 1963, 1965-66 as an average, each in periods before the Award went into effect, and after the Award went into effect. Isn't it true [404] that the casualties to persons of all classes, to employees on duty, and to train and engine service employees on duty, were higher in the two year average before the Award than they were in the two year average after the Award in spite of the fact that the man hours were substantially reduced during those intervals? A. In absolute, they were above, not substantially above in many cases. In terms of train operations, the units of exposure, they are not nearly as, in fact they are down. They don't show any upward adjustment at all, but on the downward side. Now, you keep referring back to the man hours. The fact is that there has been, as I indicated earlier, a substantial change in the crew size in engine service that would affect the man hours considerably. To illustrate the point further, if you operated a train with only one man on it and you had a train accident or a casualty because you ran into another locomotive or car or you hit someone at a grade crossing, and if you use that man hour basis as a measure, that one accident would be five times as great as though you had a

five-man crew on it. It is not an appropriate way of measuring this type of situation.

Q. Haven't you said in other proceedings, Mr. Greer, that December, 1963, was an extraordinarily high month for [405] casualties because of weather conditions? A. Yes, sir, I have.

Q. That is true, I take it. And that would probably raise the 1963 figures pretty high. Is that right? A. That one single month, December, 1963, has got to be in some yearly figures, whether it was in an annual figure or whether it was in a calendar year basis or a fiscal year basis. December or any other month is in there.

Q. When you choose to use a year ending August 31, December, 1963, would be in the year, as you have it in column 1 on page 8, the year 1964, I take it? A. The year ending August 31, 1964, yes. When you said I choose, I took the latest data that was available.

Q. Insofar as the year ending August 31, 1961 is concerned, was there any data available for possible inclusion in this chart? A. Yes, it could have been calculated from the same source as this material. I would have carried the comparison back though in 1960.

Q. The data on page 9 is fundamentally taken from the raw figures which you have on page 8. Isn't that correct? A. Yes, sir.

Q. So the same observations that we have made about the raw figures will be reflected in the percentages which are [406] placed in the table on page 9? A. Yes, sir.

Q. Except that here you have for the first time in this series introduced an exposure factor which here is million locomotive and motor train miles. Right? A. For the first time in this series?

Q. In this series, I believe. A. No.

Q. Well, the series called—— A. The series relating to casualties?

Q. Yes. A. Yes.

Q. For the first time now you have introduced an ex-

posure factor in the charts beginning on 6, 7 and 8, and that exposure factor which you have chosen is per million locomotive and motor train miles? A. Yes, sir.

Q. Here again you selected a year ending August 31, 1966. Is that correct? A. Yes, sir.

Q. Now on page 10, which is the final page in the casualty section of your exhibit, the purpose of page 10 as distinguished from page 9 is to change the exposure factor and make it in terms of billion gross ton miles. Is that correct? [407] A. The purpose is to show the quarterly and semi-annual and annual variations in terms of that exposure measure, yes.

Q. Billion gross ton miles? A. Yes, sir.

Q. Why didn't you show the quarterly changes in terms of locomotive and motor train miles? A. No particular reason, except that this material was prepared and I added a new quarter. I have some of the date here for, on the basis of train miles, and in general the trends are about the same. The degrees of differences are not quite as great.

Q. Would you say that billion gross ton miles is the exposure factor most favorable to your position. That they really didn't amount to much in this whole accident increase? A. Well, it is obvious from the figures that we have already examined, that there has been a greater relative increase in gross tons miles than there has been in train miles, and that, of course, measures the fact that we have been handling a great deal more business for the same train miles. And this comparison here is designed to show those results in terms of the gross ton miles.

Q. Let's see if I understand what you are saying. The exposure factor we have talked about are man hours, locomotive [408] train miles, car miles, which you have a little later, and gross ton miles? A. Yes.

Q. And net ton miles? You also have that A. I don't use that factor.

Q. The four then, of the four, billion gross ton miles is

the one that we will indicate that increase in accidents really doesn't amount to much, where on the other extreme man hours will indicate the greatest increase in accidents, and particularly casualties in related accidents? A. Well, as I have said before, to attempt to measure total casualties in terms of man hours or casualties in employees on terms of man hours, would provide us the figures. The Interstate Commerce Commission consistently uses locomotive and motor train miles as a measure for which to determine the rate of casualties to total employees on duty.

Q. In general, can it be said that the data on page 10 is subject to the same observations that we made about the data on page 8 and 9, with two exceptions. One is that it chooses a new exposure factor, being gross ton miles, and secondly, it does a quarterly anlaysis which hasn't appeared in previous tables? A. Yes, sir.

Q. Now, to go to page 11, Mr. Greer. Here you have a different year, a year ending June 30. What is the basis for selecting that? [409] A. The availability of the data. The individual railroad data is accumulated by the Interstate Commerce Commission on a quarterly basis. The latest quarterly figures that are available are those for the quarter ending June 30.

Q. Nineteen—— A. 1966. To use any other basis would have omitted the most current figures.

Q. On certain other charts you chose to include portions of a year. Did you have any reason why you did not choose to include portions of a year on this? A. Well, this is a table that is made up of analysis of the data for the sixty-seven individual railroads on an annual basis, and that is the reason why there is no portions of years shown here.

Q. Could you tell us why the bottom of the left-hand column on page 11 you chose to make the comparisons of 1962 to 1966 and from 1964 to 1966 as distinguished from other possible ranges of years during this total period? A. Yes. The period 1964 to 1966 includes the two year period

before and after the application of the Award of Arbitration 282 with the exception that the year ending June 30 includes a portion of May, from May 7, and the entire month of June immediately after the application of the award, during which time the impact of the Award had had practically no [410] affect, or only moderate affect, comparing a two year period, comparing the year before and the full year after, the latest year after the effect of the Arbitration Award had taken place. The annual comparisons are all shown here, 1962 to 1963, 1963 to 1964, 1964 to 1965, and 1965 to 1966. They are right there. It is not very difficult to make any type of comparison you want. The more significant ones were from the beginning, those that I thought, were from the beginning of the period to the last of the period, and those closest to the effective date of Arbitration Award 282.

Q. Yesterday you testified that the data on pages 11, 12, 13, 14, 15, which established the two classes of carrier was drawn off, I think is the term you used, from data published by the Interstate Commerce Commission. What data published by the Interstate Commerce Commission did you use to get these figures? A. ICC statements M-400, ICC operating statistics, and ICC wage statistics Form B.

Q. Do those documents divide up railroad, divide up statistics by railroad companies? A. Yes, sir.

Q. Which document is that? A. ICC Statement M-400 shows by railroads on a quarterly basis data relating to train accidents, collisions and the other elements used here in these series of five tables.

[411] Q. As to the individual railroads in the two categories, the problem is created in this period of time by the fact discussed before, that some railroads reported locomotive train miles and some railroads reported locomotive unit miles. Isn't that correct? A. Yes, sir.

Q. And we also agreed before that there was a lot of variation between the different reporting railroads in this respect. That is, some of them did it the same way all

along, and some of them converted at the time the ICC made it clear that the change should be made? A. Yes, sir.

Q. Did you make individual adjustments for this kind of conversion? A. For the years 1961 through 1964 I calculated by quarters the appropriate and correct exposure, checked my methodology with the Interstate Commerce Commission Bureau of Safety and they approved the method and said these were the appropriate mileage factors to be used.

Q. How did you know which railroads reported one way and which railroads reported the other before the change was made? A. By the comparison of their operating statistics submitted to the Interstate Commerce Commission with the data which they submitted on Form V to the Safety Section of the [412] Interstate Commerce Commission. Some of the railroads were substantially the same, others had this problem of reporting unit miles rather than locomotive train miles during all or a portion of this 1961 to 1964 period.

Q. And you are testifying that you projected individually on the basis of individual analysis of individual railroads, published information to make up for this difference in reporting that involved some of the railroads? A. Yes, sir. Published data available at the Interstate Commerce Commission.

Q. And it is published in those forms that are listed at the bottom of page 11. Is that correct? A. Yes, sir.

Q. And I suppose that your answer in this respect as to the data in this section would apply to all the tables in Section III, that is, in which the division between thirty-five and thirty-two carrier groups is made? A. Yes, sir.

Q. Will you turn, please, to page 12. Collision is, as I recall your testimony yesterday, one of a kind of train accidents. Is that correct? A. Yes, sir.

Q. Another kind is derailment, and the third kind is all other? A. Yes.

[413] Q. Why did you select collisions as a kind of accident that deserved special attention in your tables? A. Primarily because of the emphasis that was put on the collision aspect by the witness for the operating organization before the Senate Committee and also before the Wisconsin courts. That was the primary basis for singling out collisions. The witness for the organization had said words to this effect, that of all types of train accidents, collisions would be the one that would be most closely related to the crew size, the engine crew size particularly.

Q. In this chart, in other words, you are anticipating our proof in this case. Is that correct? A. To a certain extent, yes.

Q. Is that true of other things you have in here? That we are going to say there is some significance between rising accidents and diminishing crews, and you are making these in answer to what you anticipate? A. Yes.

Q. Would you agree it was Mr. Homer who made that contention, isn't that correct? Mr. Winfield Homer? A. Yes.

Q. Would you agree with Mr. Homer that collision is a type of train accident which is particularly responsive to the size of the crew? [414] A. No, I don't agree with him in the terms which he would make the statement.

Q. Would you agree with me, without regard to details of what he said, that collision is a type of accident that is particularly responsive to the size of the crew? A. I agree with the point that usually collisions are directly related to the, more directly related to the compliance of the rules, with the rules in the observations of members of the train crew, particularly the engine crew and the train crew to a secondary degree in terms of flagging to prevent collision. There is a closer relationship there than there is to a derailment caused by defective tracks or a spreading track or defective equipment. To that extent, I would say yes.

Q. In fact a large majority of collisions as they are coded in terms of the ICC Code, a large majority of collisions are attributable to something an employee did or failed to do. Is that right? A. Yes, sir.

Q. And I think you listed flagging, but other kind of things is passing signals, and keeping a lookout, and things of that kind. Isn't that correct? A. Yes.

Q. Did it take awhile for the Award of Arbitration Board 282 [415] to go into effect, that is, was it a month or two after May when the process of veto selection and so on was made prior to the time the employers actually laid off firemen? A. You are dealing now with the firemen?

Q. Yes, firemen, only. A. Yes, it was accumulative, to a certain extent, but there were immediate changes effective May 7, for example, if I recall the figures correctly, overall in the month of May, 1964, about six or seven per cent of the operations were conducted without firemen. By June I think it had reached twenty per cent. Most of the groundwork, a great deal of the ground work for applying the Award had been done in the period in which the case was tied up in the courts. And the Award permitted the separation of men with less than two years service immediately.

Q. Would you look on page 12 at the next to the last horizontal column, 1962 to 1966 Change in Collision Rate, which again is the year that this time ends June 30. Do I understand those figures to show that for the longest interval, longest number of years computed on this chart that the group of carriers had fewer firemen increased collisions by 36.4%, whereas the group of carriers that had more firemen increased collisions by only 28.9%? A. Yes, sir.

[416] Q. The tables on pages 11 and 12 deal with types of accidents, whereas the tables on 13 through 15 deal with casualty rates. But in both instances the only exposure factor is locomotive and motor train miles? A. Yes, sir.

Q. With reference to page 18, and you gave some testimony, although I objected at one point to your reading, but in the testimony that you gave, did I understand you to say that the Arkansas law requires a crew of five when there are fewer than twenty-five cars?

Mr. Lucente: I believe you sustained his objection to that.

Judge Van Oosterhout: It was a point of law. Unless you can state some purpose for it. It is just a point of law. I don't believe the witness is a proper source of information. Unless it is credibility or something.

Q. Now, would you please turn to page 20, Mr. Greer. It is true, isn't it, in general that state by state accident and casualty data is very difficult to get in any kind of details. Isn't that true? A. Well, the state by state accident data that is published in the M-400's is all that is available.

Q. And what is that total data that is published in the M-411 as to individual states? [417] A. The total for train, train-service and non-train accidents, the total train accidents, the casualties in train accidents to total persons, and train service accidents to total persons, and non-train accidents to total persons, and the casualties in train, train-service and non-train accidents at highway grade crossings, is the extent of the state data that is published in the M-400, I believe.

Q. Is it fair to say that in regard to the table on page 20, and particular reference to column 8, that the trend of the percentage of Arkansas accidents to the United States total, the trend is downward in this period which involved the reduction of crews in other states. Isn't that the overall trend revealed by column 8 in both casualties and accidents? A. Not in the entire period. It is down from 1962, but it is only slightly downward from 1964, and an increase in 1965. I am looking now at the train accidents trend. And on the casualties the per cent in Arkansas were identical, 1.18% in 1964 and 1966.

Q. Isn't the statistical trend pretty clear in that five year period? A. In a five year period there has been a generally downward trend interrupted by the most critical of all the years, 1966.

Q. Didn't you testify yesterday that the statistical annual evaluations are many times misleading because a particular [418] year can throw the whole thing off; that a longer period is better way to evaluate a trend? A. Dealing with trends generally, yes.

Q. Well, the trend here in a five year period, which is, in the middle of which the reduction of crews in other states took place, the trend here is steadily down. There are yearly variations in the graph, if you made a graph. But it is down both as to accidents and as to casualties. Isn't that correct? A. Yes, that is correct.

Q. All right, let's turn then to page 21, if you please. Here again, taking the longest period of time available on this chart, here again you selected June 30, in the period of 1962 through 1966, or June 30 of those years. The longest period of time which is least likely to show individual yearly variations which might relate to weather and all such things is 1962 to 1966. Is that correct? A. Yes, between June 30, 1962 and June 30, 1964, are three of the five years involved here. There was no substantial change in crew size, and no change in crew size at all until the late spring of 1964. So that your asking about a trend, you are relying on two terminal years—1962 and 1966. That is one way of looking at it, but [419] there are several other ways of looking at it, too. 1967 might show a different picture.

Q. It might. Due to the fact that it is a little unreliable to worry about year to year trends, especially in view of weather and peculiar traffic, things that might arise, I understood you to say yesterday that the best indicator is a fairly long, long run thing as you can, long run period, assuming that your exposure factor is the

same and things like that. And on that basis isn't the best indicator here, the 1962 to 1966 period, the five year period? A. Dealing with the abstract, only with the trend in Arkansas, yes. The purpose of this is entirely different, as I explained.

Q. Isn't the most significant figure on each of the two tables, one relating to accidents, and one to casualties, the two figures that appear in the lower right-hand corner of each table, that is, that in the adjoining states—which I think you testified do not have full crew laws—that the longest period of time showed a 38.3% increase in accidents, whereas Arkansas showed only a 26% increase in accidents, and a comparable situation as to the decrease in casualties shown by the far lower right of the bottom table that the decrease [420] in casualties during that period was much greater in Arkansas than it was in the surrounding states during the five year period punctuated in the middle by the change in crew consist. Isn't that the most significant figure on the whole table? A. No, sir. It has some significance, but not in relation to the thrust of this material to show that there really is no relationship between the year to year changes in relation to the crew size. Because here we have, for example, between 1964 and 1965 an increase on the one hand and a decline on the other. And in 1965 to 1966, looking at train accidents, increases in both, but an increase in greater magnitude for Arkansas. Now, that is the sole purpose of this material, is to show the facts, to illustrate the facts that these terms the reduction in crew size in the other states has not resulted in any differential changes that are not inherent in the year to year changes. It would be much more sound if we had seven or eight years of experience without firemen. This shows all the experience we have without firemen, and we certainly can't conclude one way or the other here that there is any relationship between the absence of firemen and the occurrence of accidents.

Q. Am I wrong in my recollection of what you said yesterday that year to year comparisons are dangerous because of [421] peculiar conditions that might occur in a year that would affect the measuring standard that you use? A. I don't recall in what context that might have been said, if it was said. I don't frankly recall it. But I would certainly agree to pick out a certain year, or a certain period and excluding all other factors rely on that, would be a mistake.

Q. Would you please turn to page 22, Mr. Greer. Here again the longest period of time in which a measurement is available on this chart, here again you have June 30 as your year end. Is that period which is shown in the lower right-hand corner of the two charts. Isn't that correct? A. Yes, the longest period that is shown there.

Q. And as to the train accident figures, the longest period that reflects a substantially greater increase in states without full crew laws than the increase in States with full crew laws. Isn't that correct? 35.8, 34.8 increase in full crew states, whereas a 46.4% in non-full crew states during that five year period? A. Yes, that is what the data reflects, and if you will look at all other states you will find that that increase occurred before the effect of Arbitration 282 on firemen.

Q. Let me ask you this, Mr. Greer. Isn't it true that before Arbitration Award 282 that the average train crew—I am [422] distinguishing it from engine crew—that the average train crew in the country was smaller in other places than it was in Arkansas? A. Yes, sir.

Q. And the average freight and yard crew in particular were smaller, on the average, in the rest of the country than they were in Arkansas even before 282? A. Yes, sir.

Q. Referring to the bottom half of the chart on page 22, the far right, again referring to the full five year period which you have analyzed here, it shows that Arkansas and New York had the greatest percentage drop in cas-

ualties of all the full crew states. Isn't that what it shows? A. Between 1962 and 1966, yes.

Q. Isn't it true, based upon your experience in analyzing records and things, that Arkansas and New York have the most comprehensive full crew law of all the full crew laws? A. By comprehensive, you mean requiring the most number of men?

Q. Under the most circumstances the most number of men, yes, sir. A. They certainly are among the highest, if not the highest.

Q. All right.

* * * *

[423] Would you turn please to page 24, Mr. Greer. Now in this chart, as I understand it, you first reach the question of years prior to 1961, or you first begin to show statistics of that kind of historical ventage. Isn't that correct? A. Yes, sir.

Q. You said yesterday that there were some differences in accident reporting requirements by the ICC. In fact, there have been three different periods in that respect, have there not? A. Yes.

Q. One period was that period prior to 1958 and going back as far back as we would go in connection with these figures. A. 1957.

Q. 1957 and back? A. Yes.

Q. Okay. Another period was 1958 to 1960, and the third period was 1961 on up to now. Is that correct? A. Yes, that is correct.

[424] Q. Now, you indicated to the Court yesterday that in fact those changes would assist the railroad's position in this case because they would by making accidents reportable now that were not reportable before they would tend to expand the current accident statistics. Is that correct? A. Yes, sir.

Q. Weren't there many factors that worked the opposite way in those changes? That is, that tended to

make accidents reportable before that are not reportable in subseque[illegible] periods? A. Well, there were some situations like that, but not of the same magnitude as the one the three day change. They would be relatively small, where this was a major factor. I don't recall all the details of them, but in general they were of a minor nature as compared to one the three day change.

Q. Can you name any? I am asking for any of the factors involved in the two changes, 1958 and 1961, which tended to reduce the reportability of accidents as compared with prior periods. A. Are you talking about train accidents?

Q. Either train accidents or train service accidents. A. In 1957 the definition of train accident was substantially changed, and that would tend to cause a decline in the [425] number of reportable accidents, for example, between 1957 and 1956.

Q. Is that the $750 matter? A. Yes. That was formerly $350 immediately prior to the change including the cost of clearing the wreck. And it was changed to $750 excluding the cost of clearing the wreck, and that, of course, eliminated a number of, at that time a number of train accidents that would otherwise have been reportable.

Q. Do you know whether or not the Interstate Commerce Commission took into account how long the $750 figure would last as the reportability dollar value standard? A. I don't think it could specifically set a period for which it would be appropriate, but the fact is that it has lasted from 1957 through 1966.

Q. Has it more than doubled in what year? 1957? A. Yes.

Q. Anything else that you can think of which tends to reduce the reportability of accidents now as compared with earlier years? A. Well, there were some minor changes, changes which would have a minor effect on whether or not the accident pertained to railroad opera-

tions. It is my recollection, and it has been some time since I reviewed those precisely, is that [426] would have tended also to increase the number of reportable casualties rather than to decrease them. As far as recollection, that is as far as I can go. The documents are available.

Q. Let me see if I can refresh your recollection. During the period of 1958 to 1960, the second of the three reportability standard periods, weren't certain accidents ruled out as being reportable which included personnel, like clerical and sales personnel of railroads? That is, those were not reportable during that period? A. I think that is right. That would have a minor effect on the total, very small.

Q. All right, I have got some others. Let's see about them. During this same period, from 1958 to 1960, weren't disabilities resulted from aggravation of previously existing physical conditions ruled out as far as reporting was concerned? A. I think so.

Q. During the period of 1958 to date, including the second and the third period, which we have been discussing, haven't suicides been ruled out as a reportable matter, whereas before 1958 most suicides were included? A. I think the definition was changed to the extent that if the coroner said it was a suicide, before it wasn't reportable, and now it is a little bit broader definition, but I don't [427] think the suicides in the aggregate would change the per cent at all.

Q. All right, we can argue about that later, but the fact is that the change in definition was made? A. I think so.

Q. About 1958, so that now suicides are not reportable where prior to that time most suicides were reportable? A. I wouldn't go along with you and say that most. More suicides were reportable.

Q. That is good enough. Isn't it also true that during the period of 1958 to 1960, that reporting period, that

accidents resulting from extraordinary forces of nature were not reportable, whereas during the period before that they were reportable? A. I believe so.

Q. Isn't it also true that in the period of 1958 to 1960, in particular, and to some degree since then, the chief medical officer of the carrier makes the decision as to the relation between the accident and the disability which could have some effect on reportability of accidents, whereas before 1958 the chief medical officer of the carrier was not given that kind of discretionary latitude? A. I think there was a change of that type, but what effect it could have, is a matter of conjecture.

[428] Q. Change of type is good enough for my answer. Thank you. Isn't it also true that from 1958 to 1960 and to some degree since that time, that the railroads coded the causes of accident, that they did it unilaterally from 1958 to 1960, they did it in an advisory manner since that time, whereas prior to that the ICC coded accidents? A. The ICC did code then, and is currently coding them under the instructions.

Q. Doesn't the railroad now have a greater perfunctions in the coding process than it did prior to 1958? A. I don't believe so, not under the current regulations.

Q. All right, turn again to page 24. Don't you have a period, Mr. Greer, I am not sure I heard it from you yesterday, but I have read it in your testimony other places, before the Senate particularly, involving density, that the density of railroad traffic increases the accidents not on a one to one basis, but on something much greater than that? A. Yes, that has been the experience.

Q. And under those conditions, is the contrast on page 24 between the 1925-1929, assuming that we can make some comparisons in view of the reporting changes, but assuming that we can compare them. The 1925 to 1929 period compared to the 1961 to 1965 period, you show on column 14 that there is a substantial amount less

of locomotive and motor train [429] miles. A. Yes, but that is only one measure of density.

Q. It is a measure of density? A. It is a measure.

Q. Wouldn't your density period explain—excuse me, density theory explain the drop in the total train accidents that has occurred, comparing those two periods? A. Well, it would have some effect on it, but certainly it would not account for the entire change, and to try to place an evaluation as to whether it counted a small part or significant part, would be pure conjecture. The fact is there has been, as the tables here indicate, a substantial decline in the frequency of train accidents, of many reasons. But the primary reason is that we do have modern, up-to-date and safer railroads now than we had in the 1920's.

Q. Would you please turn to page 25. Let me ask you this preliminary question, Mr. Greer. Statistically how does the accident rate compare between trains using diesel locomotives and trains using steam locomotives? A. I don't know. Are you comparing the accidents over one period or another, or are you taking a train that operates where you have a combination of steam and diesel? Of course, the operations are now all diesel. What terms do you ask that question?

Q. I am trying to understand if you would say that the operation [430] of the diesel locomotive in terms of accident statistics, motor train miles, locomotive and motor train miles, the operation of the diesel locomotive is any safer or any less safe than the operation of the steam locomotive. In terms of the statistics on accidents per locomotive or motor train miles. A. I have made no precise study of that type, so I would, it would merely be conception.

Q. Doesn't your table on page 25 give a good analysis of that? Let me call your attention to columns 6 and 7, it is also applied to columns 4 and 5—columns 6 and

7 will suffice. Train accidents—— A. Are you on page 25, sir?

Q. Page 25, yes, sir. Columns 6 and 7, you have got a whole bunch of different periods. These are, I take, calendar years, and not years ending June 30 or August 30 or other periods like that. A. Certainly are, calendar years.

Q. Let's look at the period 1930 to 1939. Now that was almost wholly a steam locomotive period, was it not? A. Yes, sir.

Q. And then let's look at the period 1950 to 1956. That was almost wholly a diesel locomotive period, was it not? A. No, no, the railroads were not completely dieselized [431] until about the middle of the 1950's. There was a great deal of dieselization, and probably the majority of the transportation was hauled by diesel locomotives in that period, but not exclusively.

Q. Okay, that is good enough. From 1950 to 1956, that entire period a majority of the motive power was diesel as compared with steam? A. Yes.

Q. And from 1930 to 1939 a majority of the motive power was steam as compared with electric or any other kind? A. Yes.

Q. Now, those periods span World War II when you had a high traffic increase. Isn't that right? A. From 1930 to 1939? I thought we were talking about 1950.

Q. The span, that is, they are on each side of World War II. A. Yes.

Q. Heavy traffic period? A. Yes.

Q. And isn't it generally true that the train—well, first of all, the far right column we should look at, column 9. In general the train miles in millions were about the same in the 1930 to 1939 period as they were in the 1950 to 1956 period. Isn't that correct? Generally so? A. Well, if you can use the term "generally" underscored, yes.

[432] Q. I am willing to underscore it. Isn't it also gen-

erally, underscored, true that the train and train service accidents in column 7, or the train accidents in column 6, or for that matter the casualties figures in columns 4 and 5, were also the same in those two contrasting periods where the total train miles were about the same? A. Well, of course, if you look at 1930 you started off with a 38,000 figure, and in 1950 you started off with a 30,000 figure, and then you had the period of the depression in the early 1930's where the train—I am looking at column 7. Is that the one you wanted me to look at?

Q. Any one of those, 4, 5, 6 and 7. A. They are, in general, of about the same magnitude, but there are year to year differences, and they start at a different date.

Q. I am willing to underscore "generally" again.— Now, turning to the chart on page 26. Isn't this same kind of comparison again true, that is, the period of 1930 to 1939 as compared with the period 1950 to 1956, where the traffic was about the same, the kind of motor power was steam in the earlier period, in general, and diesel in the later period, in general, and the casualty accidents, train and train service accidents, et cetera figures were about the same. Isn't that right? A. In general, yes.

[433] Q. Here I think you make the note in the bottom which I had brought out in connection with previous tables, and I think you testified to yesterday, there are three different periods of reporting, and great care has to be taken in relying on comparisons among those periods. Isn't that correct? A. Yes, that is particularly true with respect to casualties in terms of what happened after 1961, and would affect the train accidents in terms of comparisons between 1956 and 1960.

Q. That note of warning applies to tables in pages 24 and 25 as well as the table on 26? A. Yes.

Q. One chart that I have no difficulty with is that on page 27. Let's skip to page 28. Is all the material on page 28 contained in figures published by the Interstate

Commerce Commission? A. Well, yes. It is contained in the basic data that is furnished to the Interstate Commerce Commission. The Commission, of course, doesn't publish it in this form of separation between the five railroads that operate in Arkansas and other states, but basic data is all derived as indicated in the footnote.

Q. From the T Forms? [434] A. From the T Forms, yes.

Q. How many T Forms are filed per year with the ICC would you estimate? A. Well——

Q. Thousand? A. Oh, yes.

Q. Several thousand? A. It would be the total—there is a Form T furnished by each train accident and train service accident, so it would be in the thousands.

Q. Did you comb through these thousands of reports to get the data, particularly that relating to Arkansas, and other states? A. No, I did not. As the footnote indicates, summaries furnished by the reporting railroads to me, based on examination of data contained in their Form T.

Q. Are those summaries furnished to anybody else? For example, could they have been available to us prior to trial, outside of ~~some~~ legal procedure. Are they published, or anything like that? A. No, the summaries are not. The Forms T are available, but, as you say, it would have been quite a job to have gone through the Form T's, although they are filed by railroads. And it would have been a practical operation [435] to examine the T sheets and put the Arkansas accidents in one pile and the accidents on the other parts of the railroad in another.

Q. So your data here comes from summaries on state-by-state basis furnished to you by the railroads that are plaintiffs in this case? A. It comes on the basis of summaries furnished precisely the way it is presented here, Arkansas and all other states. I did not ask the railroads to tabulate the data by individual states except for Arkansas. Withdraw Arkansas and make two summaries.

Q. Do you know if the railroads have data organized by state to state without regard to this particular litigation? A. It depends. It varies on what kind of data you are talking about.

Q. Well, the kind of data that is reflected on the chart on page 28. A. Some states require that the accident data be reported to State Commissions of Public Utility Commissioners, and in those states I would assume the railroads keep the segregation. Where there are no requirements, they do not keep that type of tabulation; although it is available, by rearranging the material.

Q. Now, what this chart purports to show is, I assume that it purports to show that somehow in Arkansas as contrasted [436] with other states in which there are not full crew laws that the accident rate is not significantly lower, or something like that? A. Not so much the accident rate itself, but the trend in the accident rate. Because there are variables from state to state depending on many conditions as to the levels of the accident rate, but this is to show that over this period there hasn't been any significant difference in the trend of accidents.

Q. Don't the railroads also keep summaries which would be available to you concerning accidents in crews that have firemen and crews that don't have firemen? A. No, sir. Not that I know of.

Q. Do any railroads keep that kind of information? A. Not that I know of. The Form T report does not contain information as to the size of the crew, except with respect to the employees that might be injured. If there is an employee injured, his name and occupation would be listed. But ordinarily that information is not submitted on the Form T reports. Now, the railroads did at our request for several months keep a record of the train accidents that resulted where the firemen were not employed, and they gave us some data which was included in the National Joint Board report and other data for a short pe-

riod of time. But any overall [437] comprehensive analysis of train and train service accidents by the absence of the firemen is just not available without a special study.

Q. Why did you not see fit to include those that related to the particular absence of firemen, if it had, in this period of exhibit? A. We didn't have any data comparable for this period. In fact, we don't have any data of this type at all that would reflect whether or not the firemen were employed or not employed on these T sheets.

Q. As to casualties, total casualties in train and train service accidents, and casualties to employees in train and train service accidents, referring to column 5 and those two cross columns, it actually shows that in the two complete years prior to the Arbitration Award 282 that Arkansas had a higher percentage of the total than in the two complete years subsequent to the year of that Award. Isn't that correct? A. Yes, that is right.

Q. By the way, are these calendar years, from January 1 to December 31 that you selected in connection with this? A. These are the calendar, full calendar year. The full calendar year data is available on the individual railroads because they have already made their reports to the Commission. [438] But the summaries that the Commission prepares from the data submitted by the railroads, as I have previously indicated, is only available through August, of 1966.

Q. Now, the chart on page 29 also would furnish us the same problem in terms of having the summaries available. It was internal company summaries that you relied on in, for the data on page 28 from which you made your computations on page 29. A. That is right.

Q. Page 29 simply reflects the same data in terms of three exposure factors—locomotive train miles, and here for the first time we have car miles as an exposure factor for casualty rates, and gross ton miles. Right? A. Yes.

Q. Why did you select car miles as an exposure factor?

A. Because it again reflects the extent of the traffic handled in terms of the number of cars handled, somewhat in the same manner that the gross ton miles expresses the total business handled in relation to the total weight of the cars, as contrasted to the fact that the train miles only measures the units of separate operations, which is yard engine hours, train miles operated.

Q. Why did you not use car miles in connection with other charts in the exhibit? [439] A. I just didn't think it was appropriate to compare them, although the trends, to take the time and effort to burden the exhibit with other figures, although the trend would have been substantially the same as gross ton miles and train miles data.

Q. Did you at the time you selected car miles, give any consideration to the possibility of selecting man hours as an exposure factor? A. No, not for this purpose.

* * * *

[440] **Redirect Examination,**

By Mr. Lucente:

Q. Mr. Greer, you were asked some questions by Mr. Youngdahl with respect to the date shown on page 3 of Plaintiffs' Exhibit 109, referring to the straight time hourly rate shown there for maintenance of way and maintenance of equipment employees. Is the 1966 rate, the currently effective straight time hourly rate? A. No, sir. For the maintenance of way employees the rates increased five per cent effective January 1, 1967. And for the maintenance of equipment employees the carriers have offered that same five per cent, but the case is still in dispute.

Q. And does the agreement with maintenance of way employees provide for an additional increase beyond the five per cent? A. Yes, it calls for an additional two and a half per cent effective January 1, 1968.

Q. Have agreements also been made in recent months involving wage increases for employees represented by the

Brotherhood of Locomotive Firemen and Enginemen? A. Yes, sir.

Q. When was that agreement made, if you know? A. It was made in November, and called for a retroactive increase of five per cent, retroactive to August 12, 1966.

* * * *

[441] Q. What is the situation with respect to employees represented by the Brotherhood of Railroad Trainmen? A. They also entered into a similar agreement calling for five per cent retroactive to August 12, 1966.

Q. Mr. Greer, you were questioned at some length this morning about the use of man hours as an exposure factor in calculating casualty rates. Turning first to the casualties which accrued to all persons in train and train service accidents. Is there, to your knowledge, any man hour figure available which would take into account man hours applicable to the kinds of individuals involved in such accidents? A. No, there is not.

Q. In other words, all persons include people for whom no man hours statistics are available? A. Yes, they include outsiders other than employees.

Q. Now, you also show casualties on a rate basis accruing to employees on duty in train and train service accidents. I refer specifically to page 8 of Exhibit 109, Mr. Greer. Does it appear from that page that statistics are computed by you in considering that page and the following page showing the casualty rate applicable to employees on duty? A. Yes.

[442] Q. Are man hours available applicable to the category of people encompassed by the concept of employees on duty? A. Yes, but those man hours would bear little or no true relationship to the exposure factor of the great bulk of the non-operating employees who are not, whose area of work does not bring them in contact with train operations, locomotive and train operations.

Q. Do employees on duty, as that term or phrase is used

in column 3, include not only the employees involved in the operation of trains, but all of the classes and crafts of railroad employees? A. Yes, all the clerical employees, and all other types of employees.

Q. The next column there, column 4 shows the casualties accruing to train and engine service employees from train and train service accidents, does it not? A. Yes.

Q. What employees are included in the category of train engine service employees on duty? A. The engineers, firemen, conductors, brakemen and switchmen.

Q. What is the relationship between the number of casualties accruing to the so-called train and engine service employees and all employees on duty? A. Well, in the neighborhood of 85% to 90% of the employees on [443] duty casualties occur to those employees that are directly engaged in train operation—engineers, firemen, conductors and brakemen, and the remaining 10% to 15% to other employees on duty.

Q. Now, when a man hour factor is used to determine frequency rate, or as an exposure factor, what percentage of the man hours which would be used in such a computation accrue on behalf of the train and engine service employees? A. In the neighborhood of seventy per cent, seventy per cent plus. About seventy-two or seventy-three per cent of the man hours of all employees are employees other than train and engine service employees.

Q. You misunderstood my question. I asked you for the percentage of man hours which would accrue to the train and engine service employees in that total consist of man hours used for all employees on duty? A. The reverse of that. Between 23 and 25 to 30%.

Q. And then if I understand you correctly, between 75% and 70% of the man hours used to determine that frequency rate would be man hours attributable to employees other than train and engine service employees? A. That is correct.

Q. Then these other employees are those who are involved in approximately 10% of the casualties. Is that correct? [444] A. That is correct.

Q. You were also asked about the use of man hours in another respect, Mr. Homer.—I am sorry, Mr. Greer, and that is with respect to train and engine service employees on duty, and your explanation, as I understood it, was that when you are dealing with the period from 1962 to 1966 the fact that firemen positions and firemen employees have been eliminated from engine crews causes a distortion in the casualty rate shown on that period of time. Did I understand you? A. As a composite of all of the train and engine service employees, yes.

Q. Would you just explain briefly what causes that distortion in the trend of the casualty rate computed on the basis of man hours for train and engine service employees over the period from 1962 to 1966? A. Because the frequency of accidents to firemen is much less than the frequency of accidents to conductors and brakemen in freight and yard service. Therefore, if we remove both the hours and the accidents, and there was no change in the frequency among the other classes, the removal of those hours and those accidents where the firemen have been removed would result in an increase in the composite, whereas the accident frequency actually has [445] not changed among the individual classes.

Q. Have you prepared a table consisting of two sheets which illustrate the point you have just made with respect to the use of man hours to compute a casualty rate for train and engine service employees? A. Yes, I have.

Q. Is the document which I have identified as Plaintiffs' Exhibit 114 the table that you have prepared on the subject? A. Yes.

Q. Would you please just explain briefly what the table shows Mr. Greer? A. As indicated in the Source, the data for 1963 and 1964 are taken directly from Table 103, of

the ICC Annual Accident Bulletins for those two years. The data for 1965 are taken from Advance Work Sheets prepared by the Commission and in precisely in the same form and precise figures that have already been sent to the printer to be included in the 1965 Accident Bulletin when it is released. This table shows for each of the eighteen classes of operating employees—engineers, conductors, baggagemen, brakemen, flagmen, and passenger freight and yard service—the number of casualties segregated as between fatalities and casualties including fatalities, both in train accidents and in train and train service [446] accidents. The data on sheet 2 shows the man hours for each of these separate eighteen classes. As is indicated in the title to the table, this data covered Class 1 line haul railroads only, because that is the only group of carriers for which man hour data separated by reporting, ICC reporting divisions is available. The man hours are shown for each of the three years, 1963 being the year before the effect of Arbitration Award 282; 1964 being the transitional year; and 1965, the latest year subsequent to the enactment, to the Award of Arbitration, effective date of Arbitration Award 282, which is available in this form.

Q. And in sheet 2 of your table have you computed the casualty rate for each of the classes of employees shown? A. Yes, the casualty rate is identical to the casualty rates shown in Table 103, except that I have excluded from the casualty rates the non-train accident casualties, the casualties to operating employees that are not in any way related to the operation of trains, locomotives or cars. The rates are shown for each of the years for each of the classes, and the composite for the eighteen classes in terms of casualty rates per million man hours 24.73 in 1963 as it appears in Table 103——

Q. That is at the bottom of column 4 on page 2? [447] A. That is right. 26.07 in 1964, and 26.12 in 1965. Columns 7 and 8 I show these on the basis of an index with 1963

as a base to show the percentage relationships between the man hours for each of the classes, and the same type of index for the casualty rates. To illustrate the point, the man hours for a fireman in 1965, thru freight firemen were only 68% of those in 1963, local freight firemen only 57%, yard firemen only 49% of the 63 man hours. The casualty rates for firemen in freight and yard service ranged in 1963 from 5.76 to 13.93 for divisions 128, 127 and 126, the bottom division shown on the table. This range in 1964 was 6.59 to 14.20, and in 1965, 5.02 to 11.15.

Q. From a comparison of those casualty rates with the casualty rates shown for the other classes of employees, what is the situation with respect to the relative levels of casualty rates of firemen and other operating employees? A. Well, the casualty rates for other operating employees particularly freight and yard service employees are from five to seven and eight times as great.

Q. During the period following the effective date of Award 282 there was, was there not, a reduction in the number of firemen hours reported to the Interstate Commerce Commission? A. Yes, as is indicated in the man hours columns.

[448] Now, at the bottom of the table in the little block with the three columns are the years 1963, 1964 and 1965 are shown with the composite casualty rates, train and train service accidents per million man hours for these eighteen classes. Based on the actual current man hour weights for each of the years 1963, 1964 and 1965. In the adjacent column these rates are re-calculated on the basis of the same man hour distribution that occurred in 1963 that actually were operated in 1963. And as you can see, of course, the 1963 rates are the same, but the 1964 rates instead of being 26.07 becomes 25.46, and the 1965 rate instead of being 26.12 becomes 24.79. Thus, the percentage change reported, using the current man hour weights would show from 1963 to 1964 an increase of 5.4%,

weighted on 1963 man hours an increase of only 3%. Between 1964 and 1965, the actual figures show an increase of 0.2% based on current man hour weights, and a decrease of 2.6% based on 1963 man hours. Between 1963 and 1965, the year before and the year after the application of Award 282, the current man hour weights show an increase of 5.6% whereas using the 1963 man hour weight to eliminate not only the difference between the firemen man hours but also this would also eliminate the shifts between freight and [449] passenger service over this period, shows practically a level rate, 0.2% increase. 24.73 compared with 24.79.

Q. What is your conclusion then, Mr. Greer, with respect to the reasons for the difference of plus 5.6 shown at the bottom of page 2, and plus 0.2 as shown in the right-hand box? A. That difference is entirely to the shift in man hours brought about by the factors that I mentioned, primarily the removal of the firemen on about half of the freight and yard operations.

Mr. Lucente: We offer in evidence Plaintiffs' Exhibit 114.

Judge Henley: Would you explain to me once again what this man hour weight business is at the bottom. I am not sure I understand it.

A. Yes. These are the actual man hours in columns 1, 2 and 3 of the various classes. Now, this is a weighted average for 1963 of 24.73 based on a 1963 man hours.

Judge Henley: Well, I understand that, but how is it weighted and what does it mean.

A. It means that this is the rate, the composite rate for the train and engine service employees, the composite casualty rate per million man hours for these eighteen classes, 24.73.

[450] Judge Henley: Do you mean that there were 24.73 injuries for each million man hours?

A. Yes, sir. Now in 1964 the rate was 26.07, and in 1965,

the rate was 26.12. Now using the 1963 distribution of man hours and the same identical individual casualty rates in each of these columns 5 and 6, you come up with a composite rate for the eighteen classes not of 26.07 but of 25.46, for example.

Q. What you have done then, Mr. Greer, is to take the casualty rates for firemen applied to the 1963 hours and add that increment to the 1965 statistics as reported? A. Not only for firemen but for each of the classes.

Q. But this is in addition to the, addition of fireman hours and fireman casualty rates to the 1965 data to make it, as far as weight is concerned, equivalent to the 1963 data? A. That is one way of saying it, yes.

Judge Van Oosterhout: Have you had sufficient opportunity to examine the exhibit, or do you need more time?

Mr. Youngdahl: I don't think any more time would do any good. We object to the exhibit.

Mr. Lessenberry: We join in that objection.

* * * *

Recross-Examination.

By Mr. Youngdahl:

Q. When did you prepare this particular document? I am referring to Plaintiffs' Exhibit 114. A. I believe last week, or week before.

Q. Can you tell us why you did not submit it with your original group of charts? A. Because I didn't think we would need to get into the man hour basis except on the basis of what might be said on cross-examination, using the same type of attack that Mr. Homer used last time, and his counsel used the last time I testified on this subject, and having looked at Mr. Homer's exhibit where he does use man hours as a measure of both train accidents and casualties.

Q. Can you tell us why you did not include 1962 in the calculations? A. There is no real reason except that to

use this material on the basis of the bridge, we only need one year before and one year after the change to show the effect that I am talking about here in terms of pulling out a great number of the firemen man hours.

Q. Isn't it a fact that if you used 1963 as 100 in the index that the year 1962 would produce a percentage below 100? [452] A. Well, the index is not the important element here. The shift is the important element.

Q. I understand what you are talking about, but I—let me start this way. On page 2 of Plaintiffs' Exhibit 114 at the bottom right corner of the top chart it appears to me to reveal that using 1963 as the base 100 index that casualty rates are 5.4% higher in 1964 per million man hours, whatever it is, and 5.6% higher than 1963 in 1965. First of all, that is correct? A. Yes, that is correct.

Q. Isn't it also true that 1962 percentage was below 100? A. The 1962 casualty rate?

Q. Yes, what was it? Was it below or above? A. I can't recall. If it was below, it wasn't very much below. It was in the same neighborhood, whether or not it was slightly above or slightly below 24.73, I would have to look up the figure.

Q. Before the major change in crew consist took place in 1964, wasn't the casualty rate per man hour steadily going down than in the several years before that? Maybe not steadily going down—— A. I think it went down in 1961, and went up again in 1962, but I would have to have the precise data in front of me.

Q. You don't know offhand? [453] A. No. What differences they were, they were not of a great magnitude.

Mr. Youngdahl: That is all I have.

Judge Van Oosterhout: You may be excused.

Witness excused.

Mr. Light: At this time pursuant to our general stipulation among counsel concerning the presentation of evidence from documents, and also pursuant to specific

stipulation filed on Monday morning concerning two particular tables of information, I would like to read into the record so as not to burden the record with extensive exhibits some proof that goes to specific allegations in the complaint. Pertinent to the allegation in the complaint in paragraph 11 that the cost of compliance for the year 1914 of the St. Louis-Iron Mountain and Southern Railway Company, which is the predecessor of Missouri Pacific Railway Company, of compliance with the switch crew law was $54,800 the annual cost. That proof appears at page 60 quoting testimony given in the Norwood case in the brief filed on behalf of the appellant, the testimony as quoted, and I would like to display this to counsel, I have displayed it to counsel for Intervenors earlier. And I submit that in support of the allegation in paragraph [454] 11. Pertinent to the allegation in paragraph 12 (a) of the complaint that in 1931 Missouri Railroad Company had 824 freight locomotives and 217 switch engines all powered by steam, and 410 of the freight locomotives had been in service prior to 1908, this is contained in the record of the Norwood case at page 244 in a chart listing the locomotive ownership and history of acquisition and retirement—let me correct that. At page 243 of the document that I identified, identified as Plaintiffs' Exhibit 8 in the Norwood case, and supplies that information. I believe that I have already showed that to you, Mr. Youngdahl, just the figures of the complaint. Is that satisfactory. Concerning the allegation in paragraph, the same paragraph as that pertaining to the locomotives of the complaint, the statement "during the year ending June 30, 1961, sixteen persons were killed and 259 injured due to steam locomotives on all Class 1 railroads in the United States." In support of that—

* * * * *

[455] Mr. Light: In support of the allegation in the same paragraph of the complaint to which I just referred, that

during the ten year period ending June 30, 1931—I stand corrected, the entire sentence, and I will read it now, in support of which I offer Plaintiffs' Exhibit 8 from the Norwood case, the entire sentence is supported by that exhibit. "During the year ended June 30, 1931, sixteen persons were killed and 259 injured due to failures in steam locomotives on all Class 1 railroads in the United States, and during the ten year period ending June 30, 1931, six persons were killed and 179 injured from this cause on the Missouri Pacific Railroad alone." That entire statement is supported by Plaintiffs' Exhibit 8 to the Norwood case. Now, finally, in that connection, in support of the sentence in the same paragraph of the complaint, "locomotive improvements contributing to the safety of employees have been such that in 1961 no persons were killed or injured due to failures in the steam locomotives on any Class 1 railroads in the United States, and only seven persons received injuries due to defects in diesel or other locomotives." I display to counsel Accident Bulletin No. 130 of the Interstate Commerce Commission for the calendar year 1961 where tables appearing at pages 32 and 33 support that sentence.—in support of the statements contained in paragraph 12 (b) to the effect [456] that in the years 1924 through 1928, inclusive, Missouri Railroad Company transported an aggregate of 1,090,448,051 car miles in Arkansas, and also that injury rates for the 1924 through the 1928 period considered by the court in the Norwood case were produced at the rate of .00276 per hundred thousand car miles, and .07176 per hundred thousand car miles. In support of those allegations—I will not burden the record with putting these tables in. These are tables from the Norwood case that were introduced into evidence, and which I have displayed to Mr. Youngdahl, and which support those figures.

Judge Van Oosterhout: You are making them a part of the record here, though, are you?

Mr. Light: Your Honor, I wanted to make only the specific figures that I alleged in the complaint a part of the record here. What has occurred, we are four years from the time these figures were compiled for the complaint, and not as current as the figures that have been given in evidence, but I do want to have the particular figures alleged in the complaint supported by record proof.—In support of the statement contained in the same paragraph of the complaint to which I just referred that during the 1924 through 1928 period, injuries to employees on the Missouri Pacific system were in the aggregate of 727 road [457] trainmen in freight service injured and 603 yard men injured, I have supplied Table 5 from the Norwood record to Mr. Youngdahl which supports that figure. I have also supplied him an additional table containing comparable data for the 1958 through 1962 period, which reflects that during the years 1958 through 1962, inclusive, only 85 road trainmen in freight service and 92 yard men were injured in Arkansas on the Missouri Pacific operation. I have also supplied to him prior to trial an additional table for the years 1958 through 1962, inclusive, showing that the Missouri Pacific Railroad Company transported in Arkansas during that period 1,338,459,454 car miles in the State of Arkansas. And I have also supplied to him an additional table for the period 1958 through 1962 reflecting that on the Missouri Pacific the average injury rate during that period was .00045 per one hundred thousand car miles and .02534 per one hundred thousand train miles.—I believe that is all. Plaintiff rests.

Mr. Youngdahl: Your Honor, we object and move to strike all of the references made by Mr. Light, let me ask if I may of counsel, did all the figures which you have just related relate to Missouri Pacific only as distinguished from the other railroads. My recollection was that they did.

[458] Mr. Light: That is correct.

Mr. Youngdahl: Our objections to the material are based upon several grounds. While we plead prior to trial and the agreement is on file, I think, that it would not be necessary to authenticate documents, we did not agree that the documents were thereby material, relevant or good proof of what they purported to prove, and we object to the figures and information just supplied by Mr. Light on this kind of grounds, particularly that which was supplied in briefs and other cases. It is highly incompetent evidence, it is hearsay and has similar infirmities. We further object to receipt of this material on the ground that the accident rate for Missouri Pacific is inadequate and misleading in the facts which are relevant to this proceeding. And that it would have to be similar rates for all the railroads involved, or all the railroads covered by the full crew law for it to be of any consequence in the case. Finally, we object on the grounds that the figures computed by car miles and train miles are misleading, incompetent, et cetera on the kind of grounds that were discussed by me with Mr. Greer this morning.

Mr. Light: Let me, Your Honor, make certain that I understand the scope of the first of Mr. Youngdahl's listed objections. It is my purpose to avoid introducing [459] into the record these documents for the purpose of proving some eight or nine figures that I read to the Court, and I have in mind that it would cost somebody several thousand dollars to print these documents on appeal of this case, when they are very isolated figures I want in the record. Now, if this objection goes to that, I would like to know about it.

Mr. Youngdahl: No, sir. I do not dispute the fact that the documents named by Mr. Light do reflect figures which he said they may reflect.

Judge Van Oosterhout: They are the figures as shown in the proceedings from the Norwood case that he referred to.

Mr. Youngdahl: They are shown in the documents to which he referred.

Judge Van Oosterhout: That is what I mean.

Mr. Light: With respect to the remainder——

Judge Henley: Mr. Youngdahl, do you contend that the transcript of the testimony of the record in the Norwood case would not be admissible in this case?

Mr. Youngdahl: My offhand reaction, Your Honor, is that the best evidence of what is relevant and material during the Norwood case is what the Court found in the Norwood case to be relevant and material in that case. I think that the record in the Norwood case would be better [460] evidence than what a brief in the record says the transcript says. That is the sum of my reaction to your question, if Your Honor please.

Judge Miller: Those documents you read from were from the record and not from the brief?

Mr. Light: One item that I read from was what I take constituted the record before the Supreme Court of the United States in the Norwood case. It is a printed document styled Appellants' Exhibit, some 450 pages long, and contains what appears to be printed reproduction of the exhibits introduced in the District Court. They don't happen to call it the record. The other document, the one that I read the $54,000 figure from was the brief of one of the parties in the Supreme Court of the United States, in which there is a quotation from the record.

Judge Miller: All right.

Mr. Light: It contains the quotes and with the record reference. With respect to the balance of Mr. Youngdahl's objection on relevancy, I won't take the Court's time, I understand——

Judge Miller: We understand. I think we do.

Judge Van Oosterhout: I understand. Do you go as far as the admissibility of those documents themselves, that is, if those documents he has referred to would be ad-

missible here, he agreed that the pertinent excerpts that [461] he read would be admissible.

Mr. Youngdahl: Yes, sir, I do.

Judge Van Oosterhout: There is no foundation that this was a brief filed in the Supreme Court, and that this was the record filed and that sort of thing?

Mr. Youngdahl: That is correct. My objection goes to the kind of issue that what is said in the brief or conceivably what it says in the record in the Norwood case, is not necessarily evidence of what the Missouri Pacific had in 1931. We don't have the opportunity to cross-examine the witness, for example. I think in terms of what the Court found in the Norwood case in the very detailed finding that certainly we are bound by that, and bound by what some individual said even in the transcript, and certainly in a brief quotation from the transcript. It seems to me that it would not be admissible here.

Judge Van Oosterhout: The ruling will be reserved. There is no objection to the identification or authenticity of exhibits.

Mr. Light: Plaintiffs rest.

Mr. Youngdahl: Intervenors move that the complaint be dismissed on the grounds that the plaintiff totally failed to adduce the proof which is necessary to meet their burden on the constitutional issues before the Court.

Mr. Lessenberry: The defendants join in that motion, Your Honor.

[462] Judge Van Oosterhout: The Court will overrule the motion at this time. You may proceed with your evidence.

Mr. Lessenberry: The defendants' proof was admitted in full by the nine submitted written affidavits that were offered Monday morning.

Judge Van Oosterhout: They are already in the record.

Mr. Lessenberry: They are in the record. Defendants have no witnesses to call to present any proof that they might have.

Judge Van Oosterhout: Very well, thank you.

Mr. Ross: The Court is aware that we have already presented exhibits 1 through 35, excluding one number, as part of our proof. At this time I would like to call Warren Pelton as our witness.

[463] MR. WARREN H. PELTON,

being called to the witness stand on the part of the Intervenors, after being duly sworn, testifies as follows:

Direct Examination,

By Mr. Ross:

Q. State your name and address, please. A. Warren H. Pelton, 5805 "B" Street, Little Rock, Arkansas.

Q. And by whom are you employed, Mr. Pelton? A. Missouri Pacific Railroad, Arkansas Division, North Little Rock.

Q. How long have you been employed—when were you first employed by Missouri Pacific? A. In November, 1941.

Q. In what occupation were you employed? A. Locomotive fireman, on hand-fired oil burners and locomotives.

Q. Mr. Pelton, will you briefly go through your background in railroad, and your experiences since 1941. A. From 1941 to 1944 I was fireman, as I said, on both the hand-fired and the stoker fired and oil burning locomotives in North Little Rock. From 1944 to 1946 I was an Army Paratrooper. From 1946 to 1953 I was firing steam and diesel locomotives on this same territory. And from 1953 to 1954 I was road foreman of engines on the Memphis Division with headquarters at Wynne, Arkansas, and had [464] some of the duties of a road foreman of engines on the Union Railroad at Memphis.

Q. Road foreman of engines is an officer of the railroad company? A. That is correct.

Q. During the time that you were road foreman of engines at, of the Memphis Division, what type of motive

power was used on that division? A. Beginning my time there we had steam locomotives, stoker-fireds, and hand-fireds, and then we complete dieselized the Memphis Division. We had some of the earlier diesels prior to and during the first part of 1954 operating through this territory. But we completely dieselized the territory.

Q. During your tenure as road foreman of engines of the Memphis Division, the change-over was made to diesel power? A. Completely, yes, sir.

Q. What instructions did you receive in the operation of the diesel electric locomotive at that time? A. When the diesels were first introduced on Missouri Pacific we had instructors from the factory and we also had some supervisor personnel of the railroad that rode the engines and showed us by doing and instructing both the engineer [465] and the fireman in the proper handling, and the fireman on the proper duties on these type of locomotives. The locomotive manufacturers had schools on the property at Little Rock, the American Locomotive people, and we were given first simple instructional manuals and then later operational manuals covering the class of locomotive that was introduced. It also, we had diesel instruction or instruction cars, which were passenger coaches equipped for classrooms, with personnel or instructional personnel of railroads that were made available to us. And as we during the time we working day in and day out, road foremen who had been prior instructed would instruct us, on the newer introductions of power.

Q. Were these particular instructions which you are speaking provided for the officers, that is, the road foreman and trainmaster and so forth, as opposed to the employees, working operating people? A. The supervisory personnel, the road foremen and in most cases I have to assume, had been to schools. I myself went to American Locomotive school at Schenectady, New York, before I was a road foreman on my own for six weeks.

Q. Was that schooling on the diesel electric locomotive? A. It was, the American locomotive.

Q. What instructions, if any, were given on the diesel [466] locomotive to operating people, and to whom? A. The—at first, the factory personnel would ride the engine along with the road foreman. The road foreman would instruct the engineer in the proper handling of the diesel, the difference between the braking and the application of power, as between the diesel and the steam engine, and the factory personnel would instruct us what and how to start the engine, how to stop it, and how to reset various protective devices, adjustment of the shutters and fans. And then as the factory people left the property the road foremen themselves would instruct us and make more knowledge available to us and explain things to us, as they rode with us from time to time.

Q. Were the engineers the only operating employees who were provided instructions in the operation of the diesel electric locomotive? A. At that time both the engineer and the firemen were both received instructions in their respective duties.

Q. In their respective duties in connection with the diesel locomotive? A. That is correct.

Q. At that time what were the fireman's duties in connection with the diesel electric locomotive? A. At that time the fireman's duties was to assist the engineer [467] and first going to locomotive determining of the supplies, necessary supplies, and on the locomotive, and assisting him by lining the switches and giving hand signals to take the locomotive to the train, which was common with the steam engine. And on the older type of engine when you got underway the fireman would engage the cooling fan clutches and adjust the shutters and make regular patrol of the engine compartment on that type of locomotive, adjust the shutters as the heat demands or power demands required to keep the engine within certain temperature limits, resetting ground relays

or over-speed tips, restarting engines and whatever chores was necessary. Also, performing lookout functions.

Q. The firemen then did receive instructions in the mechanical aspects of the diesel electric locomotive? A. That is correct.

Q. All right, proceed with your resume of your background, please sir. A. From 1954 to 1955 I was road foreman of engines at Wichita, Kansas, in the Wichita Division. 1955, the latter part, was Atchinson, Kansas, as assistant trainmaster on the Omaha division, and then from the same year, 1955 to 1956 I was trainmaster at Aurora, Missouri, the White River Division, the territory is from Diaz, Arkansas, to just [468] north of Newport, to Carthage, Missouri, including the line running from Crane to Springfield, Missouri, and then in 1956, I don't remember the month, the latter part of 1956 to early 1957 I was transferred as trainmaster to Nevada, Missouri, as trainmaster on the Joplin Division, with territory from Rich Hill, Missouri, to Carthage and to Joplin, with a branch line or a light duty subdivision running from Liberal to Coffeyville. And then in 1957 I was transferred to the Southern Kansas Division with headquarters at Coffeyville, and in June of 1958 I resigned as an officer and returned to North Little Rock and exercised my seniority as fireman on the Arkansas Division.

Q. What were the circumstances of your resignation, Mr. Pelton? A. It became impossible for me to give the time necessary to the duties of a trainmaster and also the duties of a father and a family man, and I made the decision to return to my seniority district.

Q. You made several moves, I see, from the time you became road foreman in 1953 until you resigned from your trainmaster position in 1958. A. That is correct.

Q. Mr. Pelton, how did you become an engineer, promoted and [469] qualified engineer to operate trains? A. When we first hired out I was given a book called progressive examination book, and was told by the rail-

road personnel that hired me that in time I would be expected to write this book and to study the various mechanical devices that it covered, and in a period of time this book would be graded, and I was also given what we refer to as a bound book which is the rules and instructions for the operation of air brakes, and at that time steam equipment, passenger cooling equipment. This book is a mechanical instruction book. And was told that these would be graded. We had to write the answers in them. And we had to make a certain grade, 80%, I believe, on the first year. The second year we would make 85%, and the third and final year we would have to, I believe these figures are correct, 90%. We had three chances to pass the examinations——

Q. Excuse me, Mr. Pelton, is this the book of which you speak, or the current edition of the book of which you speak? A. Yes, sir, I believe, yes, sir.

Q. And the attached page changes which make the book current? A. As I understand, this is the current. I took the examination when the questions related to steam were in the book. I don't know—just one moment. This book is an up-graded [470] book. It is of the same general trend. The book that I passed had numerous steam questions, dealing particularly with steam engines, and this book, of course, deals with the diesel, and evidently this page deals with certain questions that have been dropped.

Q. I believe the page represents deletions of questions which pertain to steam locomotives. A. And certain air brakes are deleted. At that time I was told——

Q. Excuse me just a minute, Mr. Pelton.

Mr. Ross: We offer the Progressive Examination for Locomotive Firemen and Standard Examination for Locomotive Engineers into evidence as Intervenors' Exhibit IX 38.

* * * *

Q. What are the present rules of the Missouri Pacific Railroad concerning this progressive examination? A. If a man fails to pass the required written examination and oral the third time, he is the same as moved from the [471] seniority list and he is no longer an employee. He loses his seniority and his job.

Q. These are examinations which are taken by a fireman before becoming an engineer, are they not? A. The first and second year are the progressive examinations; the third year is the examination that, if you pass it, gives you the air brake card which says, the mechanical card which says you have passed the required examination on air brake and machinery for locomotive engineer.

* * * *

Q. After a fireman passes the progressive examinations is he then promoted to engineer? A. He is then, has another examination to take which pertains to the Uniform Code of Operating Rules, and when the services of the fireman are needed as engineer, then the company calls classes and they take examination on the Uniform Code of Operating Rules. After they pass that they can [472] be used as engineers.

Q. Are they at that time placed on the engineer's extra board? A. When their services are needed.

Q. The first time they are called is when they are placed on the engineer's extra board? A. A man can be called in an emergency and used. He will still not be established as a locomotive engineer, but the first time he is called after he is assigned to an engineer's extra board then he establishes his seniority date as a locomotive engineer.

Q. If a fireman fails to pass this examination to conductor then he is dismissed from service. Is that correct? A. Engineer, I believe you said conductor.

Q. I am sorry. I stand corrected. Other than the examinations, written materials and classes which the fire-

men attend, what experience does the fireman receive? A. The fireman receives the experience of being on locomotives under all different conditions, getting the feel of different power consists, the—how different engines under different conditions brakes, how the brakes hold, how the pulling power of the locomotive, also he gets experience in the actual application of the rules, the understanding, the knowledge of the rules. These are things that when you first start out, it is very confused. Then with experience [473] and with the training that is available, both by rules, quiz classes, air brake instruction cars, of which you are encouraged to attend, plus the on-the-job experience day and night under all the weather conditions, a man builds a reservoir of knowledge that assists him later on.

Q. Does the fireman obtain any experience in the actual operation of the locomotive? A. Yes, sir, he does. Some of the firemen's duties is hostler helper and hostler.

Q. What is a hostler, Mr. Pelton? A. A hostler is a man that from the ranks of the fireman, at present he has been employed two years, who is called with another fireman, or in some cases, a laborer, to move the diesel locomotives out of the shops or to the fueling tracks, places them for fuel, supplies, couples them together, moves them from service tracks to the prepare shop tracks, or in some cases moves them to the yards. The fireman, if he is an outside hostler, the helper, acts then when the movement is made from the yard to the train or to the train yard, he lines the switches and gives the necessary signals.

Q. Are the jobs of hostler and hostler helper limited to firemen? [474] A. The jobs of hostler are limited to firemen. The hostler helpers job, they are outside jobs, mainly they work outside of the roundhouse facilities or firemen's jobs. If they work with the so-called inside jobs, then the helpers jobs can be filled with a laborer, or some other craft.

Q. What other experience, if any, does the fireman obtain in operating the locomotives? A. At times the engineer swaps with the fireman, the fireman handles the engine in the engineer's presence, and under the engineer's supervision, both in yard operation and in road operation.

Q. Mr. Pelton, what is there to learn about the operation of this locomotive? A. To learn the operation of the locomotive, first, each type of locomotive has certain limitations and certain instructions would apply to that locomotive. In other words, the limitations I am referring to is the ability to pull, how it pulls, how the brakes retard, how the brakes hold under various load conditions. I am referring to switching now, where the switching movement is made with the air brakes of the switch engine only and not the train brakes. Learn to take into account all the conditions that can affect the locomotive, such as, if you have a track with a grade in it, the rail conditions, [475] have slippery rail conditions, what it requires you to do, the control of the speed, the knowledge of the signals because you need that to know how to properly handle the locomotive. And how to protect the locomotive in line with the company's instructions.

Q. What is there to learn in regard to the application of the brakes? A. We have to break it into two things. In yard operations with the limiting to large cuts which are required to handle under some conditions with only the braking power of the yard engine on, if you slam the brake on you create slack action, you can slide and flatten wheels on the locomotive, and if you allow yourself to move at too great a speed under the situation you will not have enough holding force to stop you. You have just got so much brakes and no more.

Q. What does the man operating the engine of a train have to take into consideration in stopping the train in line of road?

Judge Henley: In what?

Mr. Ross: In roads. In other than switching operations, Your Honor.

A. In stopping a freight train, or train in line of road which we have all different sizes, large trains, long [476] trains and heavy trains. First, you have a fixed amount of braking force, or holding force. The engineer, a man handling the engine must take in account that he has to use that over time and distance to be able to stop at the objective point, where he wants to stop. It is not a case that you can push harder. After you use the holding force that you have available, if you didn't start soon enough you aren't going to stop. Now, slack action is one, very damaging, you can have severe slack action.

Q. What is slack action, Mr. Pelton? A. Slack action is the changing of, each car has approximately so much free slack and so much spring slack. Now, this train all has to be started, and when that slack changes from all in to all out, if there isn't care used, when this slack, two parts of this train, the front part of the train becomes the moving say six or seven miles an hour and then as you keep going back and all of a sudden you start the rear portion, it is standing still, then you give it a jerk, that is one form of a slack action in starting.

Q. Is this slack contained in the couplers and draft gears? Yes, sir.

Q. Between the cars? [477] A. Between the cars.

Q. How much slack will there be for each car in a train? A. From my experience it runs about twelve to fifteen inches of slack for each car, including both free slack and spring slack.

Q. And this will be figured from the slack in each end of each car? A. That is the total slack of each car.

Q. So the total slack in one end of one car would be six to seven and a half inches according to your estimate. Is that correct? A. Yes, sir, that is my estimate from handling trains.

Q. Is this slack action always controlled in the same manner without regard to territory over which a train is moving? A. No, sir. You must take in account your braking practice, where your train is in relation to grades, either ascending or descending, rail conditions, and where the slack is in the train at the time that you start setting the brakes. And also the consist of the train. I mean, how the train is made up, enters into how you will have to go about controlling the slack in that train to prevent damaging shocks, or to minimize them. So trains, under some conditions, it is very hard to control, the slack of the train, to prevent break in two's, or shock severe [478] enough to injure people on the caboose.

Q. Mr. Pelton, you mentioned taking into consideration where the slack was in the train. Where will be on level track, for instance? A. Level track with a full power application, the train at running speed, I mean whatever you are up to the maximum speed for the territory——

Q. If the train is pulling? A. Pulling—slack in most cases will fairly well be out. In other words, the train will all be——

Q. Be out of each car? A. Be moving out under tension, some tension on the draft ~~gears.~~

Q. When you are going downhill where will the slack be? A. Well, some parts of the train is going downhill. If all of the train is going downhill and if you are able to outrun it, it will all be out. If you have of your train going downhill and half coming uphill, your slack will all be out. Of course, when the hind end of the train comes over the hill then there is some slack change there, but in braking it would be important that you take where the hind end of the train was in consideration to determine from experience what kind of initial reduction you were going to make to start setting those brakes. [479] Q. Does the fireman gain any experience in slack control or while he is operating the train? A. Yes, sir, he does. He observes the engineer under, the man handling

the engine under various conditions, and then as he gets time in service, shows an interest, he is allowed to handle the brakes in the presence of the engineer, and he does gain valuable experience, and the engineer gains some relief.

Q. Is there any other experience gained by the fireman that is helpful to him when he becomes an engineer? A. Well, he gains the knowledge of the terrain, the territory which he works in, where the curves are, where the grades are, location of signals, switches, train order signals, and the signals used in those yards that he works in.

Q. Does the weather conditions have any affect on the operations of the train? A. Yes, sir, they do.

Q. What affect would they have upon the engineer's operating the train? A. Of course, take the situation of high wind, heavy rains and storms over the territory which would reduce the visibility, the rule requires us to be aware of locations where there is liable to be washed tracks, and then, of course, the exact knowledge of location of the signals [480] becomes important. And in knowing the terrain it is not unusual to receive a train order telling you that high rain is reported in a certain area, heavy rains, be on lookout for points that is liable to wash. If you have no knowledge of that territory, you by necessity have to go in there much slower, feeling your way. Now, the fireman in his experience in firing over this territory under these conditions becomes much more familiar with everything than when does, when it does become his time he isn't a stranger to the territory he is operating on.

Q. When it comes his time to operate as an engineer? A. Yes, sir.

Q. What other functions does a fireman perform as part of his regular duties? A. The fireman performs mechanical assistance for the engineer.

Q. What sort of mechanical assistance? A. Answering alarms and determining what is wrong when an alarm

is sounded. Making whatever correction that can be made, getting the information back to the engineer as to what is wrong.

Q. You referred to alarms. What do you mean by alarms? A. We have an alarm bell, and in the event a condition exists the alarm will ring the alarm bell. That means there is something wrong with one or more of the power [481] units in the consist. If the trouble is on the unit you are on, you will have a light that will indicate the type. If it is on other units you won't know what it is.

Q. If the engine consists of more than one unit when the alarm, in case of some malfunction on a trailing unit there will not be a light in the lead unit? A. That is correct. The light denoting the type of trouble will be on the unit affected.

Q. What types of alarms, what types of malfunctions set off the alarm system? A. Hot engine, low oil or high suction pressure, ground relay, or alternator or NVR relay failure.

Q. When an alarm sounds is it necessary for a member of the engine crew to take some action to see what caused that alarm? A. Yes, sir. When alarm sounds you have no way of knowing what the condition is, what is giving the trouble, unless, as I said, it is on the engine in which you are riding. And if a condition causes alarm to ring you could have an engine dead, the diesel engine actually is dead from any number of conditions; you could have an engine that was overheating, the cooling system is getting too hot; you could have an engine that was off the line on account [482] of ground relay trouble it wasn't producing any power. It could be any number of things that could cause a diesel engine to shut down.

Q. Are there malfunctions for which there are no corresponding alarms? A. Yes, sir.

Q. What are some of these malfunctions? A. Engine

failing to make transition, fuel trouble, fuel system trouble, or excitation trouble.

Q. What is excitation trouble? A. That is the excitation of the main generator of the engine, it is a circuit that controls the exciting of the main generator to cause the main generator to produce electrical power.

Q. Is this one malfunction, this excitation? A. It covers quite a few different devices on the engine. It is, in a sense, one group of failures.

Q. It is a category of malfunctions? A. A category of malfunctions.

Q. Mr. Pelton, in the absence of a fireman on a train experiencing an alarm, what action would have to be taken? A. It would be necessary to stop the train to determine the cause for the alarm, because if the alarm is allowed to continue, and you not know what it is, any other [483] condition develops, that same alarm would still be ringing. You wouldn't know what would be wrong back there. You wouldn't know how much power you had left. Under some conditions that would be important that you know.

Q. Is there any malfunction which could not be located by the engineer after he stops the train? A. Yes, sir.

Q. What type malfunction? A. One type would be excitation, I mean, the excitation circuit, another would be transition, because the situation that set up transition wouldn't exist when the engineer shut his throttle off. Therefore, when he went back to look everything would look all right, under most conditions. There could be some conditions of transition that a contactor would be stuck, but in most conditions——

Q. These are malfunctions then which generally cannot be discovered unless the engine is under load. Is that correct? A. That is correct.

Q. And by being under load, we mean under power? A. Under power and at speed.

Q. Mr. Pelton, what affect can the stopping of a train or a delay of the train have on the safety of the train or the crew of general public? A. Well, an unplanned or unexpected stop there is the tension [484] that all of a sudden we need to stop, we have got to stop. You at times are faced with coming up with road crossings you don't want to block, the noise of the alarm, if there is alarm or anything, there is a human tendency to hurry the stop. There is a tendency to be able not actually to control the slack as well as could be. Another condition, at times you will stop in such a way that you will block crossing that shouldn't be blocked, such as in a community, with long trains. There is definitely an unplanned and unintended stops where you have that potential for more slack action, more damage, more change of a break in two. Each stop has that chance. You delay the operation of the railroad.

Q. How much delay would there be on a train of say a hundred cars just from the stopping of that train on an assumed level track?

* * * *

[485] A. From the time that you reduced from your maximum speed to the time that you got back to your maximum speed, I would say you would have fifteen minutes off of your total running time.

Q. Is this taking into account any time spent in correcting any malfunction? A. No, sir, this is merely properly releasing your brakes and controlling your slack. I mean in applying your brakes, controlling your slack, releasing the brakes after you stop, and properly controlling your slack getting underway.

Q. And obtaining the same speed? A. And building up your speed over some distance.

Q. What are the fireman's duties in regard to the passing of signals? A. In yard operation you have industry tracks where obstructions and curves create, fix it to where it is beneficial and safer to work on a fireman's side. Be-

cause you go in and pull out good cuts of cars around these reverse curves. Then another industry located in the same area you will be working on another curve, and we have several operation that I am aware of [486] in doing my daily work where it does expedite and make it safer to pass signals through the fireman.

Q. You refer to a good cut of cars, Mr. Pelton, what is that? A. Well, I am not referring to eight and nine car cuts; fifteen, twenty, twenty-five cars in the cut.

Q. Referring to long cuts? A. Long cuts. In some cases, fifty and sixty making shoves into rails, where curves are involved.

Q. Does the fireman have any similar function to perform on line of road while the train is moving? A. Yes, he does. At certain points when you have 75 to 80 cars to set out, the fireman due to, again, the terrain and curvature, even now will assist in passing signals and sometimes he will even get on the ground to assist in passing the signals. In the event that you have hotboxes or defective cars in the middle of trains of 140 or 150 cars, there is no auxiliary tracks to get rid of the cars to handle short cuts, and atmospheric conditions, dusty roads alongside the railroad right-of-way, and during sometimes early morning when it is hard to pass these signals for distance, even the crew is stretched out, it is necessary for the fireman at time, at certain curves to assist in passing the signals.

Q. What does the fireman do in connection with his lookout functions?

* * * *

[487] A. He in the lookout function the fireman isn't just looking ahead. He is looking out for, first lock signals, anything that could affect the movement of the train of the whole area to the left side, into the rear. Now, the brakeman looks out to the rear of the train, and the brakeman looks out to the front of the train

at times. The lookout, watching out for round curves, somebody is looking ahead, somebody is looking to the rear. If we are going around a curve to the left. The fireman looks out, the brakeman looks out. They are watching for trouble, smoke from under the locomotive which could indicate motor support bearings hot, smoke on cars which could indicate hotboxes, dust coming from under the train, abnormal dust, which could indicate something dragging that could derail a train, smoke from the cars which could indicate the cars themselves on fire, shifted ladings. Firemen also, and the brakeman, if duties permit, [488] looking out, switching in these towns that we go through, the brakeman is off passing signals for the switch operation behind, the fireman is providing lookout protection, watching against children, elder people walking on or near tracks. A lot of our main tracks go right through the middle of cities. Cars that pull on the crossing from the left side where no view is afforded the engineer.

Q. What responsibility does the fireman have in regard to track signals or signal indication along the track? A. The fireman and the brakeman both have the responsibility——

Q. This is the head brakeman? A. Head brakeman, the man who is normally rides the head end—in movement, while in movement, as all members of the crew that see a signal, to observe the signal, call the signal, and if no action taken to act on the signal, to the extent of their ability to act to prevent a violation of the rule and overrunning of the signal.

Q. Are there times when you will have train orders which indicate some conditions on the track or right-of-way which might affect the operation of the train? A. Yes, sir, at times we have train orders both in so-called dark territory where there are no signals and territory where there is signals. One of them is, we refer to it

in railroad language, as the yellow flag order, where the order will require you to approach a certain mile [489] pole, between that pole and another one, prepared to stop, looking out for certain types of roadway equipment, machines that are used by maintenance of way people, being prepared to stop at any point in there between those limits set forth in the order, and proceed only upon a signal given with a yellow flag. These locations have, in most cases, a temporary restricted speed sign placed a sufficient braking distance in advance. That sign is a small yellow sign that is shown in the time table it was entered, and in moving over the territory that is one thing you have to keep constantly in mind, and if you have the order in your possession and it is within the time the order is in effect, even though there is no temporary speed restriction signs displayed, you must approach that area at the limits set forth in the order prepared to stop, and move through the limits prepared to stop. Our method of determining where we are at on the railroad is by numbers on the poles, each forty poles there will be a number, and ten poles beyond that there will be a nickle-plated strip, twenty poles beyond that there will be two, and thirty poles beyond that there will be three. St. Louis as being the one farther away from there; Little Rock is 344, 344 miles away from St. Louis, and that is the way we locate. [490] Now, those are northbound movements on the Hoxie Subdivision are located on the engineer's side. Coming south they are on the other side, the fireman's side. This order requires, the rules require that all members of the crew see that all the rules are complied with. I mean, that is the check. The fireman looks out for that part.

Q. Is there any other publication which indicates conditions on the road of which the fireman, or of which the engine crew must be aware, take into consideration in operating the train? A. Of course, we have the book

of rules, time table with special instructions in the back of it, which we carry with us.

* * * * *

We also have general orders which are dated consecutively starting the first of each year, and remain in effect until the end of the year or until they are cancelled, and general notices which the engineer has to read, and the fireman should read, when he goes to work and sign for. Those general orders can change operating rules. Of course, general notices set forth work instructions of various types.

Q. Do members of the crew receive copies of the general [491] orders and general notices? A. No, sir, they are posted in books so designated at designated points, and there is a form there that requires you to sign the highest general order number, the current timetable number which indicates that you have read and understand the general notices, and you have to retain in your mind those affecting you on the subdivision, that portion of the railroad you are operating over. Of all of them that are in effect, you have to keep that in your mind, those of them that affect the territory you are running in.

Q. Do you recall how many general orders were issued for this district? Are they issued by district? A. Well——

Q. By division? A. Ours are issued with several different headings. The ones that I am interested in are the territory over the Arkansas Division, or the North Little Rock Terminal Division.

Q. How many, if you recall, how many general orders were issued for the Arkansas Division in 1966? A. In excess of 100. I don't know how many. They were cancelled at the first of the year. Our present one when I left the property on the 17th was General Order No. 35.

Q. For this year? [492] A. This year. But some of those had been cancelled. As I say, they remain in the

book, but they are cancelled. Some of those general orders cancel other general orders.

Q. Mr. Pelton, are you familiar with the various locomotives operated by Missouri Pacific on your territory in Arkansas? A. Yes, sir, I am.

Q. Would you describe the—what visibility does the engineer have from the cab of the F-3 and F-7 car body type locomotive? A. Visibility from the F-3 or F-7, which are fairly the same, my eye level position from the floor of the cab is 48 inches with my seat adjusted for a normal operating position. These windshields are of an inverted V. The middle part of the windshield runs up to a large center post, and it is higher than of course the outer or lower corner of the windshield. My vision directly ahead from that position, directly ahead down the tract and about a two degrees angle off to the right is good. Of course, the farther out you get the wider area you can see. Toward my right at about this position (indicating) the windshield is moving up. Now if a man is standing out in front of this locomotive, the height of a normal man, when he gets within fifteen or twenty feet of that locomotive, I am not necessarily short, but from my position I have start going up like this to see him (indicating). We have a speed recorder mounted just to the engineer's [493] left, that sits up a little to the top protrudes up into the vision line of the windshield as it moves up. Then the center post between the two windshields and the radio hand set and some of the engines is mounted right here by you. The brake equipment is over to this way (indicating), control throttle stand, my vision as I move to the left becomes a situation to where it takes something higher for me to see farther out, because I can't see—I can stand up, I have to stand up to see something even the height of an automobile directly at my corner close to the locomotive. The vision to my complete left, of course, is across the cab window and the seats on the left side. From this

position approximately left of me all the way to the rear, I have no vision. These car body type locomotives, the engine compartment is exactly the same width as the cab of the locomotive. Now, on my right front corner, this heavy post, part of the cab, we have a little wing that is adjustable, and a rear vision window on some of this type of engine. Others we have a clear view window with a small mirror in the bottom of it. I have to—due to the low post, the frame of this small window and this mirror, to see a man standing right down here (indicating), I have to stick my head out this way and [494] look down. To look behind me I have to stick my head out beyond the side of the cab far enough to see behind, or I have to turn around and lean back and look out.

Q. I hand you Plaintiffs' Exhibit 23 and refer you to page 35. Is this what purports to be the inside of the view from the inside of the F-7 car body type of which you have been speaking? A. Yes, sir, it is. It doesn't clearly show on the right side the rear view mirror which is most cases the same as the one that is on the left side, but it is mounted in this location (indicating).

Q. Is the view depicted in this picture a view that the engineer would have from his seat in the cab? A. The view is taken, in my belief, a little behind, or to the rear and a little higher than an engineer's eye level possibly would normally be. I don't, I can't correlate it with my, from a position of being seated. I appear to be looking down on stuff that I am normally looking at.

Q. Would you refer to page 40 of that same exhibit. Would you describe for the Court the field of vision that the engineer has from his seat in the cab of this locomotive. A. There is two locomotives shown on page 40.

Q. Picture "A", please, sir. [495] A. Picture "A".

Q. I am referring to the GP-7 which is a hooded-type

locomotive. Is that correct? A. Yes, sir, that is the general purpose type locomotive.

Q. Mr. Pelton, I am asking you to describe your, give your description of the field of vision that the engineer will have, not necessarily what is depicted in the picture. A. The cab of a GP-7 locomotive when you are operating from the number two control stand, the long end is in front.

Q. How long is the long end? A. I have not measured it. I would say it is in the vicinity of thirty feet, maybe thirty-five.

Q. All right. A. I believe the total length is around fifty-six. But I have the long hood, so I can look out the front windshield I can see, my vision directly in front of me and and area to the right of the track. Of course, the farther out you go, the wider the angle. But my view to look anywhere to the left, I can't start looking to the left until I have looked along side this long hood, reach the end of it. So from about twenty degrees after I reach that point of thirty-five feet beyond where I am sitting I have no vision all the way around [496] to, you can always look out of the cab window, but then you are looking about the height of the side of the cab, and you are some distance in the air. And then my vision to the rear, to my left rear is restricted to directly behind me. Then I can turn myself around and look out of a back window that is identical to the front window, of course, the short cab is on that end on that engine operating with a number two control stand. Now on my immediate right the front of the cab, of course, there is the front of the cab, and then there is a panel some twenty-two inches or twenty-four inches of steel that the windows slide behind. When I look to my immediate right I can look out through the window and see, but if anything coming right at me I have to pull my head back and look this way (indicating), because I have this place of some two foot—I don't know

the exact measurement, it is wide enough to put one of the two cab windows behind it—and then directly from this position to me (indicating) on the seat rear I can look back and look out here and see. Now, I have the same panel at the rear of that window to the back wall of the cab, where the other window slides behind. It is steel. And, of course, in switching movements where we are moving to a curve in a reverse movement on this engine I can look out through [497] the back window, reverse my seat and turn facing the controls, and look back.

Q. Is the visibility for the engineer from the GP-9, which is also a hooded-type locomotive manufactured by General Motors, is that correct? A. Yes, sir, our GP-9's have short cab front arrangements, instead of the long cab as this picture indicated.

Q. As which picture indicates? A. Well, on the GP-7 this picture indicates a GP-7 set up for number two control stand, which I described. The number two control stand is long end ahead. Number one control stand is short cab ahead.

Q. Can the engines be operated in either direction? A. Those of that class of engines that are still equipped with the two complete control systems may.

Q. Describe the SW series locomotive and visibility which the engineer has from those locomotives. A. On the SW-1200 and the 800, SW-800, it is a switching locomotive, all of them have the same configuration of their cab and hood. Again, I adjust my seat for 48 inches, my eyes above the floor. It is a position that you can work in. On this locomotive the cab is at one extreme end. The back wall of the cab is mostly glass with the metal separations for a door and the supports and there is bars across there to give [498] you a little reinforcing. And looking forward on it you have a low hood right at the cab, and then the hood slopes up to cover the engine compartment. The top of the engine compartment that

is in front of me, I have a vision directly in front that is good. The long end of these engines are operated as the front end. This hood that goes up and then flattens off to cover the engine has two large stacks up in the middle of it, and they stick up as high as the top of the cab and they have a bell in advance of the front stack. My vision looking to my left front is obstructed. It is not a case that I can stand up and look over, because the engine, the hood is so long. Now I could see a box car sitting on another track, that is true, from my left front.

Q. Is this engine depicted in Plaintiffs' Exhibit 23 at page 31 and 32? A. At 32 there is a picture. It—31 is another picture.

Q. Of the same type locomotive? A. One of them appears to be equipped for road operation, and the other one doesn't seem to be equipped for that.

Q. Is Picture "A" on page 32, Plaintiffs' Exhibit 23, does that picture depict the field of vision that the engineer would have from the seat of that locomotive, from his seat in that locomotive? [499] A. I do not believe this picture was taken from the same eye level. The picture is taken from a higher location looking down on the amp meter which is mounted on the top of the control stand, and you are a little higher in relation to that hood top level than you would be from an actual position in the seat. Now, again on this engine, looking to my left, I can look out through the windows that are located on the left side of the cab, but I can't look directly down. In this class of engine we have radio equipment mounted on top of the control stand in that front window to the engineer's left front on quite a few of our engines that creates further obstruction in the view forward. We have the same blank panel to the engineer's right where the cab window slides behind, which creates an immediate block of view, and you look

this way and out this way (indicating) to swing your body around or your head around.

Q. Mr. Pelton, I believe you said at the time you went to work for the Missouri Pacific as a fireman, steam engines were being used, or steam and diesel engines were being used. Is that correct? A. When I went to work, steam engines only were being used on the territory I worked on.

[500] Q. What portion of the fireman's time would be available to perform lookout functions on the hand-fired steam locomotive? A. At any point you were needed you had to arrange your work, and if you hadn't arranged your work the engineer hollered at you and told you to get up there, and you got up there approaching a train order signal or crossing or around a curve, and then when he got where he could see you had to get down and catch up.

Q. You had to spend a good portion of your time shoveling coal into the fire box, though, didn't you? A. That is correct.

Q. What about the percentage of time firemen would be available to perform a lookout function on the mechanical stoker-fired steam engine? A. I would say from 75 to 85% of the time, but again with the stoker-fired engine, the engineers I fired for required me even in that other percentage of time, when lookout duty was needed, to be up there. But the mechanical stoker mechanically placed the coal in the fire box and you merely controlled the throttling of it from a position on the seat, and I would say 75% of your time was available for lookout duties without being prompted.

Q. What other duties did the fireman have to perform on this [501] stoker-fired steam engine? A. Well, he got his fire in the proper condition to go, to be ready to leave, made sure that the locomotive had sufficient water and fuel, and that the stoker had its supplies, and that certain equipment was made as standard on the locomotive, and

in line of road he maintained the fire, and water. Water was of first consideration in the boiler, proper level. At water tank stops he took the water, the brakeman at times would help you to get over the road. He took the coal from the coal tipples, and if necessary, he cleaned the fire and cleaned the ash pan.

Q. Where were the controls for the operation of the mechanical stoker located? A. They were located on a manifold to the right of the fireman's seat box. There was a manifold there with various valves, and of course, there was on different types of stoker there were controls mounted up on the boiler head that you used at times.

Q. Could the fireman see and reach these controls from his seat in the cab of the locomotive? A. The steam throttle and the ejection controls, he could. It was necessary, though, at times to get down on the deck and open the fire door and look at the fire and [502] then make adjustments from leaning down looking and adjusting the steam jets. And at times it would be necessary to open coal slides back in the coal tinder.

Q. Did you ever have any experience on the oil-fired steam locomotive? A. Yes, sir, I did.

Q. Working on that locomotive, what percentage of the fireman's time would he have available to perform the lookout function? A. I would say that we had 90% of the time while in motion to provide lookout time.

Q. What other duties did the fireman have while the train was in motion? A. It was always the duty on our railroad of watching and maintaining the water level, and when the engine was working heavy and the fire box was hot of putting sand, shoveling sand out of a sand box in a thing that looked like an old sugar scoop, putting it in a funnel, and that went through and cleaned the flues out.

Q. How often would the fireman have to do that? A. It would be dependent on various engines. If I remember the instructions right we had certain minimums we had to do. About the minimums would be four times across

a 145 miles subdivision. On other engines it was necessary more often, engines that were a little harder to steam or had coal oil [503] run through them, or various things.

Q. Depending on the terrain and the load pulled by the train? A. That is correct. And we were also instructed nearing the terminal at a grade to try to bring the engine into the terminal with a clean flue.

Q. Where would the controls for the operation of the oil burner located? A. There was a valve handle located immediately to the fireman's right that controlled the flow of oil to the burner in the fire box. Again, there was a steam manifold located above and in front of that valve bolted on to the back head of the boiler where the steam valves that you controlled your jetting of the oil, the antomizing, and the steam that went back to the coil heaters and the open gear in the tank for the locomotive to keep the oil hot. There was a damper located in the door, the fire door that covered the fire box opening, and it was, of course, in the center of the cab.

Q. Were these controls within sight and reach of the fireman from his seat in the locomotive? A. Yes, sir, you could hold your hand on the firing valve and sit with the cab window, side window like this (indicating), and you could look up at your water glass and steam gauge and manipulate those controls, excepting [504] the air damper.

Q. Mr. Pelton, do you know whether or not there were some stoker-fired steam locomotives and oil burner fired steam locomotives in service prior to 1930? A. From my personal knowledge, I came on the railroad in 1941. I had seen them much younger as a boy. From Mr. German's exhibit, I understand that they were developed in the 1920's. And I was aware of a stoker order, having saw the stoker order in the past, I believe it was April 15, 1939, that engines of a certain weight were to be equipped with stokers.

Q. Mr. Pelton, from your years of experience as a fire-

man, road foreman, trainmaster and engineer, do you have an opinion as to the necessity for the fireman for the safety of the operation of the train? A. I do.

Q. What is that opinion? A. My opinion, the fireman is essential to the safety of the other railroad employees. He is essential for the safety of the public and the areas that we move through. He is essential for the efficient operation of the railroad, getting the trains over the railroad.

Q. As trainmaster, did you have supervision over the train crew also? A. In the territories in which I was trainmaster.

[505] Q. From your experience as a member of an engine crew, from your experience as a trainman, as a trainmaster, do you have an opinion as to the necessity for a four-man train crew, that is, conductor and three brakemen, for the safety operations of a train? A. You refer to a train crew, not excluding an engine crew?

Q. I am referring to a train crew of a conductor and three brakemen, which does not refer to the engine crew. A. Well, at the time I was trainmaster——

Q. Do you have an opinion? A. Yes, I do.

Q. What is that opinion? A. At the time I was trainmaster the interest of getting the trains over the railroad to such the long trains if trouble developed we needed, in my opinion we needed the men to get the condition cleared up, get the train underway and try to get the switching, if the switching was necessary, done, and not have the communities complaining about crossings blocked too long.

Q. Thank you, sir.

Mr. Ross: I tender the witness for cross-examination.

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Judge Henley: Before you start I would like to ask [506] this witness one question. I think I know the answer, but it is not clear. We got you back to Little Rock, Mr. Pelton, in 1958 as a fireman. What have you done

since that time? A. Since that I have worked intermittently for the first say up to 1959, I would go when they needed more engineers, I would be used as an engineer, outside extra boards, and then when the requirements of the work would drop off I would go back to firing. Since that time I have worked as a regular assigned engineer on the Arkansas Division, no longer firing. My seniority has moved me into position where I now——

Judge Henley: You are now an engineer?

A. Yes, sir.

Judge Henley: Thank you, sir.

Cross-Examination,

By Mr. Light:

Q. Mr. Pelton, I am not sure I heard all of the last answer you gave on your direct examination. I heard you state that you did have an opinion with respect to the necessity on safety considerations for a six man crew. That is correct that you have an opinion in this area? A. That is correct.

Q. Now, what is that opinion. I am not sure I heard it. [507] A. That it was based on my experience as trainmaster, the question was asked. The territories I was in I was interested in the trains, when trouble did develop, of being able to clear up the situation—I am referring to freight trains, through freights—and get underway and clear crossings as soon as possible or for safety. Now, my thought and my belief that when you take a short crew and they have to hurry or do some guesswork due to not having enough men, you have an unsafe condition.

Q. I take it then that it is your opinion that you need six men to run every train operated in Arkansas? A. In safety to the public and proper operations, it is my opinion.

Q. It doesn't make any difference what work load there is on that particular assignment with respect to how large a crew you need to safely operate the train. Is that

correct? A. If the train moves over public crossings when the public is involved, human life is involved, that is correct.

Q. Do you need six men to switch every train operation that goes over a public crossing safely? A. I would say yes, because we don't have the same conditions, because that operation tomorrow may not be what it is today. If you refer to just one little isolated incident.

[508] Q. Mr. Pelton, you worked as an officer of the railroad company supervising train operations in Kansas? A. That is correct.

Q. In Nebraska? A. That is correct.

Q. In Oklahoma? A. No, sir.

Q. In Missouri? A. Missouri.

Q. And in the terminal at Memphis, Tennessee. Is that correct? A. Not with the train crews or the switch crews in the terminal at Memphis. My only contact was with the enginemen at that point, and as I say, I had various assigned duties, and mainly with flat spots on diesel locomotives.

Q. And you worked in Kansas as an officer of the railroad company supervising train operations. Was it a six-man crew you were supervising? A. No, sir, it was a five-man crew, on through freights.

Q. Likewise, when you worked in Nebraska, were you supervising six-man crews? A. Five-man crews on through freights.

Q. Is the same true of Missouri? [509] A. That is correct.

Q. Did you have any crews that you supervised in Missouri with less than five men? A. At Springfield, Missouri, we did. We had the so-called forty-four tonners, the light engines, and they had no fireman.

Q. What size switch crew did you supervise at the yards in Springfield? A. To the best of my knowledge, it was an engineer, foreman and two helpers.

Q. On all the assignments throughout the periods that

you were trainman there? A. Well, now in the event a GP-7 or an engine weighing a certain weight, then a fireman was put on the job.

Q. What are the characteristics by which you would distinguish with respect to safety the operation of that four-man crew with the forty-four ton switcher. That is what we are talking about, isn't it? A. Yes, sir, the forty-four tonners.

Q. How does the switching operations conducted with that locomotive with a four-man crew differ from the one operated with a heavier locomotive with additional men on the crew, from the standpoint of safety, I will say? A. Considerable. The engine itself, the ability to handle large cuts, it has power. If I remember right, at [510] Springfield we had to put two of the engines together and two crews together. It would take some ten or twelve or fifteen, I think. This, understand I am trying to use my memory on this, I know we had to double-head quite often with two crews on these small engines to take the business over to the area in which it would be spotted. Of course, after they got it over the hump, then they split up and went about their chores. Now, those engines just didn't have the switching ability, ability to kick and do heavy industrial switching. In heavy lead switching.

Q. Did you use those locomotives to switch across any public crossings? A. Yes, sir.

Q. With a four-man crew? A. Yes, sir. A slow operation though.

Q. Is it possible that you used three-men crews on those forty-four ton locomotives, an engineer and two helpers? A. Not to my knowledge. Engineer and two helpers? Not to my knowledge. Maybe I overlooked it, but——

Q. When you were trainmaster in Missouri, and likewise trainmaster at the other places you have served, did you possess authority to add men to a crew if you thought the particular operation required it for safety? A. I never tried to exercise authority, if I had it, because the records

established from previous operations on which [511] you made your comparison on the records that you were doing current.

Q. You had such authority had you chose to exercise it, didn't you, Mr. Pelton? A. I am not aware that I did.

Q. Who actually determined how many men were going to be assigned to a train over and above the inhibition of a labor agreement or statute to the extent that management is free to decide how many to assign? A. It has always been my understanding that management could put more crewmen on an operation if they so elected. It is in the hierarchy going up through the railroad officer rank. It is very poor practice to buck an established crew consist unless you actually have a situation that you are being chewed on pretty strong about.

Q. Were you concerned at the time you were trainmaster at these other points about operating the five-man crews? A. My concern was for the crews to continue to do as they had done with my predecessor there, taking the necessary time to do the job safe. The records they had compiled in previous years was my landmark or check on what the current was in lieu of experience at that point. [512] Q. You are saying that you set as a goal for your own performance there, at least matching the safety records set by your predecessor? A. Nobody, no railroad officer wants anybody to field officers. I am not saying any railroad officer, but I am saying the field officers, particularly. We are so closely in contact with the men, if you had a man hurt plus the fact that an employee, a human, was hurt, plus a lot of paper work.

Q. Did you in your various assignments as a trainmaster and assistant trainmaster succeed in matching your predecessor's safety records? A. In some cases, I don't have the records available. It was a very live subject with me, within the scope of not disturbing the status quo.

Q. Did you understand the question? A. I think I did—Pardon?

Q. What I want to know, in each assignment where you served as assistant trainmaster or trainmaster whether you did achieve as good a safety record as your predecessor in your job? A. In some cases I believe I did; others, I don't know. I don't have the records available. I am sure you have.

Q. Did you achieve what you considered to be a good safety [513] record while working as an officer of the company as trainmaster or assistant trainmaster? A. Not as good as I desired, because if you have anybody hurt, that is too many.

Q. Did you ever have a man hurt under your jurisdiction, Mr. Pelton, while working as trainmaster or assistant trainmaster under circumstances that you attributed to the absence of additional crew members of the crew to which he was assigned? A. In evaluating it in that light, I don't know. I didn't evaluate things in that light for the sole reason that this work had been performed before in a certain time interval by this crew consist, and in investigating those injuries there was lots of factors developed and why the thing happened. Some of them were—well, there were numerous reasons.

Q. You never made such an evaluation of the circumstances of injuries that occurred while you were serving as an officer with the company in these capacities? A. I made the evaluation to my satisfaction. If we had a man who was deliberately careless, if we had a condition that we could change, then I tried to change some of the practices that could bring on personal injuries. Those that I felt was in my scope or area of authority.

[514] Q. Is that your answer to my question? A. Yes, sir.

Q. Mr. Pelton, you have related to us the instructions that you received when the diesel innovation commenced on the Missouri Pacific Railroad Company. That is correct, is it not? A. Yes.

Q. And these included instructions from factory person-

nel on the property, meaning they came to your railroad and showed you how to use the equipment they manufactured. Is that correct? A. That is part correct. The other part is that they had a classroom class with pictures and slides.

Q. Are firemen that are presently employed, go to work on the Missouri Pacific, giving this instruction by factory personnel either on the equipment or in classrooms? A. No, sir, they are turned aloose on us, and we have to do the job and teach them how.

Q. This instruction from the factory personnel was a one shot deal in connection with starting the use of diesel locomotives on this railroad on a widespread basis the first time? A. Well, I don't follow your one shot designation. But it [515] was as I would say a kindergarten in the introduction to the diesel power.

Q. It has not been a continuing instruction program for firemen, has it? A. Not after 1958 or 1959, it has lessened considerably.

Q. I believe you said that you attended instruction in instruction cars. Were those supplied by the factory personnel, manufacturers of this equipment? A. We had one car if I remember, we signed our name on the record there of attendance, and then we had Mr. Foster, a Missouri staff man, on an instruction car dealing with the problems. This was some years after diesel was introduced.

Q. Were these instruction cars designed especially for giving instruction on the diesel locomotive? A. It is used, I can remember of it having been used for various other subjects, but at that time it was on the property of the territories which I served. We were encouraged by the road foreman and the trainmaster to get in there and learn something.

Q. Has this been a part of any continuing program, the sending around the instruction car on the diesel locomotive

for the education of firemen? A. No, sir, it has not, to my knowledge.

[516] Q. As a matter of fact, Mr. Pelton, the training fireman receive when he goes to work on the Missouri Pacific is to take a few student runs and then he is put on the seniority roster as a fireman. Isn't that correct? A. Yes, sir, that is correct.

Q. And when he makes his first run after being placed on that seniority roster as a fireman, he is paid just as a fireman of twenty years of experience would be paid, at the same rate. Isn't that correct? A. That is right, and the rule requires us to look out for them, and we do. We try to educate them in their work, the way the men did us before.

Q. Mr. Pelton, you stated that you went to the American Locomotive School at Schenectady, New York, for a period of about how long? A. Six weeks.

Q. You indicated you did that on your own. You mean the company did not—— A. I paid the expense myself. I was interested.

Q. This was studying the technical, mechanical and electrical aspects of the diesel locomotive? A. The American diesel locomotive, yes sir.

Q. Would you say in all fairness that you are probably more knowledgeable in this area than the typical locomotive [517] engineer or fireman, Mr. Pelton? A. I have studied more, I would say, than some of the engineers.

Q. How many other firemen or engineers are there in your acquaintance working for the Missouri Pacific Railroad Company or any other railroad in Arkansas who has taken that college course in New York? A. What kind of course, sir?

Q. The American Locomotive School. A. Mr. Wilson, he is now road foreman.

Q. He is an officer of the company? A. Yes, he took a comparable course. You said in Arkansas?

Q. Yes, sir. A. Well, in my discussion with a lot of them, they are aware of as much as I am, and they get over the road ju as good as I did.

Q. Let's don't forget the question now. How many do you know? A. Quite a few on the Arkansas Division. They haven't took the time to go to school, no, but they have made a study.

Q. How much a fireman, or an engineer either, for that matter, learn about the mechanical function of the diesel locomotive depends largely on your interest in it and how much time they are going to take studing on their own, doesn't it? A. All locomotion examination, including the diesel, that is correct.

Q. And you take a great deal of interest and time in studying this subject, have you not? A. I am still interested.

Q. To the extent you are regarded as an expert in the field? A. I try to use what little I know to do a better job of railroading. Now the expert designation has some, I would say, some obnoxious connotations to me.

Q. Mr. Pelton, are you sufficiently knowledgeable in this field we are discussing that you testified on behalf of the Intervenors in this case before the Presidential Railroad Commission in this area? A. I assisted in the presentation before the PRC.

Q. Did you likewise give technical testimony of this character before Arbitration Board No. 282? A. I assisted in preparation and presentation.

Q. And did you also testify before the State Courts in Nebraska that was trying the issue as to the validity of that state's crew consist law? A. I did give testimony in Nebraska.

Q. Each of those tribunals, by the way, heard testimony from you substantially to the effect that you have given here today, did they not? [519] A. To some degree, yes.

Q. And heard the same conclusions that you have gi en

here today. Is that your opinion on the size crew required for safety? Is that correct? A. My conclusions are my beliefs on it.

Q. Those tribunals arrived at a diametrically opposed conclusion to yours, didn't they? A. They did, and I still work every day in it.

Q. Mr. Pelton, what job are you performing now, your current assignment? A. Currently I have what is called a new industrial area switch engine. Currently, my regular bid in assignment is what we call the NIA or new industrial switch engine going to work at the North Little Rock hump yard at 4:00 p. m. and doing switching in that, gathering our train up, making a brake test, and moving over the main line south of Little Rock to the new industrial area inside. On the 16th I overheaded a north end Little Rock to Poplar Bluff freight run, made one trip, and I got bumped back to my switch engine.

Q. What size crew do you work with on this switch engine? A. It is a six-man crew.

Q. When is the last time you worked as engineer with a crew of less than six men assigned? A. I don't remember. I worked about a year on bowl assignment. [520] I don't remember the exact date that I did, but I believe it was in—it was in late last year.

Q. You worked for about a year up to sometime last year on this assignment? A. That is correct.

Q. What size crew did you have on that switch assignment? A. Engineer, a switch foreman and two helpers.

Q. Was that a safe operation, in your judgment? A. In lots of aspects it was an erroneous, ornery operation. It was an operation that didn't come in contact with public crossings. It was a drag and shove, and straight switch out in coupling of rails out of the bowl to the 200 yard——

Q. Returning to my question. In your opinion, was that a safe operation? A. No, sir. Because it wasn't a

safe operation, and for that reason as soon as I could bid off of it onto a job with the same hours, I did.

Q. How many employees were injured on that switch crew during the year you operated it unsafely? A. None, to my knowledge, on the crew that I was on.

Q. How many members of the public did you and your unsafe crew injure during that year? A. I didn't come in contact with the public, other than employees on a company crossing.

[521] Q. Did you hurt any of them? A. Not to my knowledge.

Q. So if this was an unsafe operation, it hasn't produced any injury to anyone, his it? A. I refer to the crew I worked with.

Q. That is what I asked you. Am I to understand that you didn't have sufficient seniority to bid in an engineer's job with an assignment with a fireman at the time you worked for this year on assignment without a fireman? A. A job of the hours that I needed. I needed the hours four until midnight.

Q. Why? A. My mother was sick and I buried her last Monday, and it was at times necessary for me to stay where I could get to see her quite often after I got off at midnight or if we worked overtime, whatever time we got off. I would go to Sylvan Hills where she lived by herself.

Q. Please speak louder. A. I drove to Sylvan Hills where she lived by herself, and that was the reason that many a time, I had seniority to go to Memphis and work a freight run, but I restricted myself to those hours, and I didn't get bumped.

Q. There was a job that you could have bid with the particular hours that you wanted, for the reasons you have given us, [522] with a fireman on your seniority district? A. None that I could have stayed on. I would have been disturbed. Each time you get disturbed you usually lose a day's pay.

Q. What hours did you work on your assignment that followed this one without fireman? Your next assignment? A. NIA.

Q. What hours did that work? A. Four until midnight. The same hours that I worked in the bowl.

Q. Are you still working the same? A. I am still working that assignment. They told me I was bumped before I come to Hot Springs. When I go back I will now start exercising my seniority, I hope.

Q. Mr. Pelton, of what labor organization are you a member? A. I am a member of the Brotherhood of Locomotive Engineers.

Q. Notwithstanding the fact that you now work more frequently as an engineer than you do as a fireman; you have not joined the Brotherhood—State it again.

Judge Miller: You have got it backwards.

Q. You are a member of the Brotherhood of Locomotive Engineers. Is that correct? A. That is correct.

Q. Are you still a member of the Brotherhood of Locomotive [523] Firemen and Enginemen? A. I am no longer a member of the B. L. F. & E.

Q. Are you acquainted with a gentleman in the Brotherhood of Locomotive Engineers named C. J. Coughlin? A. I have met him just to be introduced. I am not really acquainted with him.

Q. He is the first assistant Grand Chief Engineer of that organization. Is that correct? A. I am aware of that, yes sir.

Q. Are you aware of the proceedings before the National Joint Board upon which Mr. Coughlin was the representative of your organization?

Mr. Ross: I object to the question about Mr. Coughlin as being irrelevant and immaterial to this lawsuit.

Judge Van Oosterhout: The question is to whether he is aware of it. We will permit that question.

Q. Are you aware the Mr. Coughlin participated as a member of the National Joint Board as a representative

of your organization? A. I may be vaguely aware. I am not aware to the extent of keeping up with the Joint Board. In my position I am just a member, I don't get the report on boards.

Q. Have you not held some official position in the Brotherhood of Locomotive Engineers? [524] A. No, sir.

Q. None whatever? A. None whatever.

Q. Are you familiar to the extent of knowing that the National Joint Board was composed of two representatives selected by the carriers and a representative——

Mr. Ross: I would like for the record to show that I object to this line of testimony from this document. We have reserved a right to argue the materiality and admissibility of this sort of thing for a post trial brief, and for the record I would like to enter my objection here to the questioning from this document.

Judge Van Oosterhout: What is the purpose of the line of inquiry, Mr. Light? Is it attacking his credibility or show his interest, or something of that sort, or is it——

Mr. Light: I think it would do both there, Your Honor. What I am attempting to demonstrate at this time is his acquaintance, to determine whether he has got sufficient acquaintance to pursue the matter with the official action of the organization of which he is a member—Brotherhood of Locomotive Engineers—and the official position he has taken on issues material to this lawsuit.

Judge Van Oosterhout: If the evidence isn't too extensive, the ruling will be reserved.

Mr. Lessenberry: The defendant wishes to impose an [525] objection to the line of questioning inasmuch as Mr. Light is turning to testify, not even asking leading questions. He is attempting through the questioning to submit certain information to the record, to which we object.

Mr. Ross: Intervenor would like to enter the further objection that Mr. Pelton has testified here personally and not as an official or in his official membership

capacity in the Brotherhood of Locomotive Engineers, and for that reason the questioning from this document is immaterial.

Judge Van Oosterhout: The ruling will be reserved. You may proceed, Mr. Light.

Q. Mr. Pelton, did you know that the report of the National Joint Board represented the concurring view of the two carrier members and of Mr. Coughlin, the assistant, the first assistant Grand Chief Engineer of your organization, and was to the effect that the absence of the fireman in those instances where he had been removed pursuant to the Award of Arbitration Board No. 282 had not in any way that could be determined on the examination that board had made, contributed to a decrease in the safety of railroad operations. Do you know that was the result?

Mr. Ross: I object on the grounds that this is a multiple question. I am not sure that I understand what the question is, and I doubt if the witness does. And I object to it being a multiple question.

[526] Mr. Lessenberry: We object to the form of the question.

Judge Van Oosterhout: I think that maybe we are getting a little afield, but how much longer do you think your cross-examination is going to last, Mr. Light?

Mr. Light: It will be lengthy, Your Honor.

Judge Van Oosterhout: Well, I rather think that this would probably be a good point to stop for the day, then.

* * * *

March 23, 1967.

* * * *

By Mr. Light: Q. Mr. Pelton, I believe you told us yesterday that you worked as a fireman on the various types of steam locomotives. Is that right? A. Yes, sir.

Q. On a hand-fired steam locomotive was a fireman a pretty busy man? [527] A. Yes, sir, he was.

Q. Tell us what he did. A. He shoveled coal into the fire box. On our railroad in most cases we kept—we carried the water. The engineer at times kept a watch on the water, too, but we carried it. We put the injector on at the necessary time, and we were approaching crossings or curves, the brakeman wasn't present, sometimes the brakeman was, the engineer hollered get up there, and we got up there. And then, of course, we got back down and shoveled coal. A lot of these places you would be coming into the engine would, an engine was shut off, or power demands reduced, then we would get back on the seat.

Q. Did the fireman have the job of putting out the markers on the train, either flags or lights on the locomotive? A. We had the job of placing the flags at that time, and the lights on the front of the engine.

Q. That was up high on the leading end of the unit, wasn't it? A. Yes, on the front of the smoke box.

Q. And you had to climb up over the locomotive to get up there to make this placement? A. That is right.

Q. A fireman took the water on the train. Is that right? A. He took water for the engine at the water stations.

[528] Q. How did you go about that? A. Climbed over the coal pile in most cases, and onto the back of the tank and opened the—and gave the signal for the engineer to spot the locomotive to a location that the water spout would go into the manhole on the engine, opened the lid of the manhole, pull the spout down and stand on it, and then pull a rope or rod, hold it down on some waterspouts, others we locked it down, and filled the tank with water.

Q. Was that a tank big enough for a man to fall into? A. Yes, sir.

Q. That happened on occasion, didn't it? A. Yes, sir, to me.

Q. Did you ever hear of a man falling off the tank and being injured in the process? A. Not to my knowledge.

I know we have been skinned up some, but as far as falling off, I haven't, to my knowledge I don't.

Q. What was a fireman's duties with regard to taking coal? A. He had to close the coal gates on the locomotive, and again get back up on the back of the tank or top of the coal, give the engineer a signal to get the engine in the exact spot, and pull the coal chute down, and pull the rope or chain, whatever, or rod that controlled the gate that controlled the flow of the coal, and then with that down fill [529] up, and then move the engine a little ahead to fill the whole tank, and then return the tipple or the chute to its normal position.

Q. What percent of your time would you actually spend shoveling coal into the fire box? A. If you were actually under heavy load—now this is a degree of time because of the variance in weights of the trains. On heavy trains under movement not throttle reduced, we were shoveling coal to produce the power all the time, except when you had to be looking approaching train order stations or curves to the left and crossings or congested areas.

Q. When you were moving under heavy power what it amounted to you were on the deck a hundred per cent of time except when some occasion arose where for a few moments you would go and perform the lookout function. Isn't that correct? A. In most cases. Some of our engines we could get ahead.

Q. Now, a fireman presently hasn't got any duties comparable to those that you have described except the lookout functions. Isn't that correct? A. Not of the physical work.

Q. Mr. M. N. Williams, who is a member of the Brotherhood of Locomotive Firemen and Enginemen, I believe an employee of the Cotton Belt, has testified in this case. Do you know Mr. Williams? A. No, sir, I do not.

[530] Q. His testimony was presented on behalf of the Intervenor. And he testified that he has had experience hand-firing steam locomotives and he was on the deck no

more than five per cent of the time. Do you agree that that is possible? A. On certain types of assignments that might be true. If he were on a light duty local. Five per cent of the time is jut a little bit short, but real light operations——

Q. Mr. Chrisman who is also a former fireman and whose testimony is designated IX-31 is presented on behalf of the Intervenor, testified that a fireman on a steam locomotive, hand-fired locomotive, had a back-breaking job. Would you agree with that? A. It was a physically strenuous job, yes, sir.

Q. The difference in a fireman's duties on a diesel and those that you had in your early days of railroading has been so great that you have even changed his name, what you call the job now, hasn't it? A. Well, I still call them a fireman.

Q. Have you ever heard this term fireman's helper? A. Yes, sir, I have.

Q. Isn't that what the Brotherhood of Locomotive Firemen and Enginemen refer to themselves? A. I believe that is true.

[531] Q. During the steam locomotive days, where did the head brakeman ride? A. On 1400 class, 1200 and 1300 class he rode in a dog house which was—we referred to it as a dog house, brakeman's cabin, if you may—located on the, behind the coal and on top of the water tank, and it faced to the rear.

Q. Were there other steam locomotives that you worked on in which he rode in the cab? A. On the lighter one class there was a drop seat.

Q. What function did he perform while riding in the cab? A. Lookout duty and observe the train to the rear and——

Q. He had virtually 100% of his time to perform the lookout duties in that class of service, didn't he? A. While in movement, yes.

Q. And was, of course, the primary lookout on the left-hand side while in movement on the steam locomotive? A. Primary, while in movement, yes.

Q. How did your view on the left-hand side of the locomotive to the front on a steam locomotive compare to the one you now have on a diesel locomotive? A. For directly forward movement, practically all of us, mine I had to stick my head out the window, and we had a clear view, a little window that could be closed or opened, stick our head out beyond the side of the cab and look forward.

[532] Q. There was only a small glass area to look directly forward. Isn't that correct? A. Yes, when you were sitting directly forward there was a small window.

Q. And you were looking through that glass window alongside a long boiler. Is that correct? A. That is correct.

Q. Did you have any problem with obscuring your visibility in conection with the smoke? A. Not when they were working heavy steam, but when they were shutting shut off and drifting, steam was a problem.

Q. If the wind happened to be blowing in a certain direction it would blow the smoke down past the engineer's window or perhaps the fireman's window, or both, wouldn't it? A. Under some conditions, yes sir.

Q. Would you say that your view forward and to the side available to the engineer and fireman on a steam locomotive was much more restricted than that available now on the various diesel locomotives in service? A. Forward and to the side? The view was restricted when you were sitting directly on your seat. The steam locomotive practically required you to get your head out and look through the so-called clear vision window.

Q. Well, there is no question—— [533] A. The view is better on the diesel.

Q. Far better, isn't it? A. On some types, yes sir.

Q. Mr. Pelton, I show you what I have marked for identification Plaintiffs' Exhibit 115 and ask you if that is a

fair representative picture of a steam locomotive of the general type of which you were familiar in the early days of your railroad career? A. It is typical of the steam engine we used in the early days. Of course, when I first started out, this is the larger engine.

Q. Does this show the engineer's side? A. It does.

Q. And is the view of the engineer depicted by this picture and the windows indicated on the engineer's side fairly typical of the type of view available to him on the steam locomotive? A. I would say yes sir.

Mr. Light: Your Honor, I offer this as Plaintiffs' Exhibit 115.

* * * *

[534] Q. Mr. Pelton, I show you what I have marked for identification Plaintiffs' Exhibit 116 and ask you if that is a fairly representative picture of how the cab on the fireman's side looked in a steam locomotive? A. Not on Missouri Pacific engines that I am familiar with, no, sir. The arrangement is different, different types of windows than we had, some kind of lever or something against the wall over there. I don't know what it is: I mean, you could through your experience in the different locomotives, probably get on there and operate it, but to me it is more complex than the type of locomotive that we operated.

Q. Did you have fewer valves and other mechanisms to watch and to operate than is shown in this picture? A. Well, I am at a disadvantage in answering because I don't know what all the equipment is on there. It is laid out different than the engines that I was familiar with.

Q. Let me ask you this. On the engines that you were familiar with, did the fireman's side of the locomotive have a considerable number of valves and dials and gauges of this general character? A. Of the general character, yes. I can't——

[535] Q. How many valves and guages and dials and things of that character are there on the fireman's side

of a diesel locomotive now for him to operate, watch or manipulate? A. Only one in the event of an emergency.

Q. This is an emergency brake? A. That is correct.

Mr. Light: Your Honor, I withdraw Plaintiffs' Exhibit 116.

Q. You testified yesterday, Mr. Pelton, that under present circumstances the fireman renders mechanical assistance in answering alarms, and you mentioned the hot engine alarm that he answers. What does he do to correct the condition that causes a hot engine alarm? A. He would determine which engine is giving the trouble, determine if the shutters are open, determine if the fans are running, if the engine had water. If it were possible to get the shutters open, he would do so, and in some conditions get the fans to running.

Q. Does he do that while the train is in motion, or do you stop the train to permit him to do it? A. He does it while the train is in motion.

Judge Van Oosterhout: You are talking about the diesels, now are you?

Mr. Light: Yes, Your Honor.

[536] Q. Mr. Pelton, does he do it while the train is in motion if this condition is on one of the trailing units? A. In most cases, yes, sir.

Q. What is the rule of the Missouri Pacific Railroad Company concerning maneuvers of the crew moving between diesel units while the train is in motion? A. It prohibits or says that employees will not pass from a GP to another GP or to a so-called A or B unit.

Q. That has been a rule of the Missouri Pacific Railroad Company for some years, has it not? A. That is correct.

Q. Are you telling me that you violate that rule? A. I am telling you what is actually being done.

Q. Do you personally violate that rule, Mr. Pelton, in carrying out your duties of the railroad company? A.

When I am an engineer in charge of an engine and the fireman goes back, I am guilty of violating the rule, yes, sir.

Q. You are in charge of the engine crew there as engineer, are you not? A. That is correct.

Q. Do you direct him to go back and violate the rule? A. I do not direct a man to go back and violate the rule.

Q. Do you permit him to? [537] A. Yes, I do.

Q. What other operating rules do you violate day in and day out in the normal course of your work?

Mr. Lessenberry: Your Honor, I want to object to that. He refers to other rules. I don't think the testimony of this witness is that he violates this rule day out and day in.

Judge Van Oosterhout: The question covers too broad a field. It should be something that is relevant to this cause of action.

Mr. Lessenberry: I don't think it is the violation of the rule that is in issue before this court.

Judge Van Oosterhout: The objection will be sustained as covering too broad a field. If it is anything relevant to the rules in respect to safety, it is something within the issues then you can develop, Mr. Light.

Q. You mentioned that the fireman also responds to low oil alarms. What does he do in that event? A. The low oil alarm, there are several things, courses of action on different types of power. If an engine becomes overheated or in the high temperature range and you haven't got a hot engine alarm but the engine is operating up near the limit prior to getting that alarm, oil tends to become thinner, and you make a rapid throttle change or an engine will load and unload, an engine can actually have a low oil pressure kick out. In other words, you will get the [538] alarm and the engine will die. A fireman can determine if that is the situation, the diesel engine, and reset the button and start the diesel engine, restart it.

I said the button, it is low oil kick out button on most of our engines located on the governor.

Q. This involves pushing a button on that unit? A. It involves determining which unit and resetting the button that is projecting out of the side of the governor, and checking the oil level, looking at the engine temperature gauge, determine if it is in the high temperature range, restarting the diesel engine, and make sure that the shutters are open, cool the engine down, that it has water, and——

Q. Opening the shutters is comparable to opening a venetian blind, isn't it? A. No, sir, it entials making sure certain air valves of the equipment is open, and in some cases depressing a magnet valve to let air pressure get to a cylinder to open the shutter. And in some cases it would require taking a paper cup and wadding it up and put it under the cap and screwing the cap down to hold the magnet valve open to let air go to the shutter. Then put that engine back on the line to produce power, or if he determines from his experience that the engine is in the condition that it shouldn't be operated, come back and tell the engineer [539] there is nothing I can do with it. And then, of course, the engineer uses that information as the rules require.

Q. On the ground relay alarm that you stated the fireman responds to, that amounts to go to the unit affected and push a button to reset the ground relay, doesn't it? A. Not that simple, no, sir.

Q. How complex can you make it? Tell me how it is done. A. When a ground relay kicks out and you get an alarm, that means that this engine will be idling. If the throttle is in five or six positions, or moves through those positions and stays there for any length of time, that engine that has the ground relay kicked out will be dead, and when you get to the engine, under that condition the diesel engine will be dead and you will have another light

burning. The ground relay, of course, will be reset. A man should check to see what killed the engine. I mean, make the check, restart the diesel engine, again to check and see if the ground relay is set, and then reapply, turn the isolation switch to put that engine back on the line under the engineer's throttle, and watch it.

Q. Mr. Pelton, while you are out on the road under present circumstances you have a brakeman riding in the cab with you, don't you? A. Yes, sir.

Q. He is then available to perform these functions that you [540] described yesterday and mentioned this morning that the fireman presently assists the engineer with, is he not? A. In what nature?

Q. All of these functions that you related a fireman presently conducts? A. In most cases the brakeman has no experience and very little interest in that particular phase. Had they had it I feel that they would have went by the roundhouse.

Q. The brakemen had have the same exposure to the operation of the diesel locomotive that the firemen have, haven't they? Ridden on the locomotive under all conditions and observed the engineer performing his work? A. They have ridden the locomotives between terminals. That is correct.

Q. What are the requirements for employment as a fireman on your railroad? What qualifications must you have? A. High school education and a good back, good physical examination.

Q. Aren't those the same qualifications for employment of a brakeman on your railroad? A. Same to enter service. The fireman now has to understand that he will be required to take a certain examination or a certain period of time or he will no longer be continued in service. But as far as the physical requirements, they are the same, to my knowledge.

[541] Q. Is it your experience that the brakemen that you

work with are reasonable intelligent fellows? A. That is true.

Q. That you train to do whatever chores the firemen presently attend to? A. I presume they could.

Q. Wouldn't a brakeman with several years experience as a brakeman be more useful to you as an engineer than a fireman who was just employed yesterday as a fireman? A. Well, yes. We have new brakemen also.

Q. You mentioned yesterday that part of a fireman's experience or training that qualified him to do his work is his familiarity with and study of the operating rules. That is correct, isn't it? A. That is right.

Q. Is every member of the train crew equally required to study and be familiar with and comply with the operating rules? A. That is correct.

Q. You mentioned hostlers yesterday, and told the Court that under certain conditions or certain points a laborer was permitted to serve as a hostler helper. A. On inside jobs.

Q. Yes, sir. And that could—— A. Jobs that don't touch the main line, or the yard tracks.

[542] Q. That laborer could be an illiterate man couldn't he? And some are? A. Well, I am not going to say that some are. I don't know that. He is a laborer, laborer seniority.

Q. Isn't the difference that permits the use of a hostler helper who is a laborer that the Uniform Code of Operating Rules does not apply to the operation he is participating in, and he therefore need not know the operating rules? A. I don't know about that part. I consider the operating rules as applying to all places where you are working hostling about the rules about switches and things.

Q. You mentioned part of the fireman's experience or training is that he is encouraged to attend instruction on the air brakes car. Is that correct? A. That is correct.

Q. Are the brakemen likewise encouraged to attend that

instruction? A. I can't answer that. The notices are placed on all the bulletin boards when the air brake car is there. The fireman because he know he has to pass the examination at a given time, has a greater interest in attending these cars for increasing his knowledge.

Q. Of course, you attended the instruction on the air brake car many times, did you not? [543] A. Yes, sir, I tried to.

Q. You have seen the brakemen attending there with you, haven't you? A. I have seen some brakemen in those cars, yes.

Q. You mentioned that a part of the fireman's training was the acquisition of knowledge and familiarity with the terrain over his territory riding the train. That is true, isn't it? A. That is correct.

Q. The brakeman has an equal opportunity to observe the terrain and become familiar with it riding over the territory, doesn't he? A. He does.

Q. You stated that the fireman learns how to stop the train in the course of his experience. Doesn't the brakeman have an opportunity to observe the engineer in the handling of the train, and has an equal opportunity to know how to go about stopping it? A. He observes the engineer in stopping the train, yes, sir. I don't believe that he has an equal opportunity, because he doesn't get to handle the engine and the feel of the train, and the experience of that nature.

Q. The brake valve on the fireman's side is an emergency valve, isn't it, Mr. Pelton? [544] A. That is correct.

Q. This is not a valve where you make a certain type of controlled stop where it is important that you do it in a certain fashion, is it? A. That is used for emergency stops, quick stops. It is just a complete setting of the brakes, instantly.

Q. There is no degree of application? You just pull the lever up and then the stop is then made automatically. Is that correct? A. It occurs, yes.

Q. There is no reason why a brakeman could not operate that valve just as well as a fireman, or even an engineer? A. It is a stop that is undesirable.

Q. But it is known as an emergency application of the brake? A. That is correct.

Q. You stated that the fireman learns about and becomes acquainted with a slack action in the course of riding on the train as a fireman. Does a brakeman have an equal opportunity to observe and learn about slack action? A. He learns that it exists, yes. The fireman learns more about it at the times he is swapping off with the engineer.

Q. Is slack action more or less of a problem now than it was when you first went to work on the railroad? [545] A. With a longer train that we handle today, slack action is as great or greater problem when we have large cuts of material on the end of the train.

Q. Can't you control the slack action better with a diesel locomotive or a consist of diesel locomotives than you could with a steam locomotive? A. The diesel locomotive I don't feel enters into the controlling of the slack any better. The braking equipment does.

Q. All right, sir. Then I will ask you if you can control your slack action with the braking equipment that is presently in use better than you could with the braking equipment that was in use when you first went to work on the railroad? A. Yes, sir.

Q. The engineer has got a better control? A. It is better equipped to a degree.

Q. To what person does slack action primarily present a hazard of physical injury? A. The hazard of physical injury?

Q. Yes. A. Very real one to the trainmen.

Q. People on the caboose? A. On the caboose and in some cases to the enginemen themselves.

Q. Slack action is something that while the situation

has improved through the development of a better braking system, still creates a hazard to those trainmen on the caboose, doesn't it? [546] A. It is still a problem and a hazard.

Q. Would it cut the exposure to injury from slack action in half if you reduced the number of men on the caboose in half? Isn't that obvious?

Mr. Youngdahl: We object to arguing with the witness.

Judge Van Oosterhout: That last statement could be stricken. "Isn't that obvious," I mean. The reporter might read the first part of your question.

Q. Mr. Pelton, would it reduce the hazard of slack action, the hazard of injury from slack action to the personnel on the caboose if you reduced the number of personnel on the caboose? A. Numerically if you did have a situation where slack action occurred and somebody, you had two there or four there, the potential, yes.

Q. Is the brakeman charged along with the fireman by the rules to keep a vigilant lookout while he is in the cab of the locomotive? A. All members of the crew, yes.

Q. And under present conditions there are three of you keeping a vigilant lookout on the head end of the locomotive customarily? A. Not all time, no, sir.

Q. When you are on the road, Mr. Pelton, isn't that true? A. Even while you are on the road not all three are keeping this [547] vigilant lookout ahead. When you are approaching a curve to the left the brakeman is, or to the right the brakeman is looking to the rear, looking the train over.

Q. Do you customarily under present circumstances have a fourth man riding either in the lead locomotive or in one of the other locomotives in the consist? A. Customarily leaving the terminal since we have to put men off to make these pull by inspections twice over the subdivision, two men will ride the head end, and at the first inspection point you will slow down and they will drop

off, and the train will be pulled by them, and you will pick them up on a caboose. Now, on local trains the brakeman that works the position of swing brakeman customarily tries to ride the head end of the train to be in a position when he reaches the station to get the necessary information and start switching before the conductor gets over.

Q. So under these circumstances you have four men on the head end keeping a lookout on the road? A. No, sir.

Q. Which one is not keeping a lookout? A. The man that is not riding the lead unit.

Q. What are his duties on the rules with respect to keeping a lookout and watching the train? [548] A. He keeps a lookout to the rear, that is true, to the best of my knowledge. Him not being on the engine, I don't know what he is looking at.

Q. Mr. Pelton, you mentioned that a fireman called signals, must be familiar with train orders, assist the engineer in watching for the mile post indications on the poles along the right-of-way. Doesn't the rule, or don't the rules require the brakeman to call the signals if he is riding in the lead unit? A. The rule requires all of us to cross check.

Q. Aren't all members of a train crew charged with a knowledge of the train orders? A. And a cross check on each other's operation.

Q. And the brakeman could assist the engineer in looking out for the mile post, couldn't he? A. He can.

Q. When you have these alarms or malfunctions on the diesel and a fireman is not present, what do you do? A. I haven't worked under those conditions on a line movement, road movement, except one week that these were pulled, or the firemen were pulled off sometime in the past.

Q. Was that during the period that the injunction in this lawsuit was in effect? A. I assume it was. I don't know.

[549] Q. Did you have some malfunctions or alarms at that time when you were working without a fireman? A. Yes, sir.

Q. What did you do when those occurred? A. I stopped.

Q. And went back and corrected the condition? A. I stopped on the Rock Island and it was a fifteen mile an hour operation, stopped and went back and restarted the engine, and we proceeded on to Malvern. In that case there was no other train opposition.

Q. Was that stop that you made for correcting that malfunction any different with respect to consideration to safety to any other stop you make for a block signal or train order? A. With that, the operation that I am talking about, it was at such low speed and under the terrain it was in, it would be considerable difference.

Q. You occasionally out on the road must stop for a red block signal. Is that right? A. That is right.

Q. Now, tell me what differences in the safety area there are between that sort of stop than the stop you make to go back and correct the malfunction. A. In that type of stop unless in a few cases where a signal is dropped in your face, you have an advanced warning, a [550] signal in advance that gives you a warning, tells you that you have got to proceed at a certain speed and be prepared to stop before you pass the next signal. You can plan your stop and to the most advantage, best way to control the slack under the type of train you have. You know where the signal is. You can make a good smooth stop for that signal and do then, of course, do whatever the rules require to leave that signal. You are not—the other stops you may be approaching a grade where you need all your power or in dark territory you are faced with, if you are on running and clearing time bucking a train order wait, and you have already passed the last station, then the fact that you are losing power creates a

requirement that you know you have got to do something. You are supposed to be at a place at a certain time. All of these things contribute to aggravating and creating an aggravating situation for the man handling the engine.

Q. Mr. Pelton, this is not an emergency stop that you make to go back and correct the malfunction in answering the alarm, is it? A. No, sir, it is not an emergency stop.

Q. It is a controlled stop, a service application of the brakes? A. You try to make controlled stops every time you can.

[551] Q. There is nothing unsafe about stopping a train out on line of road with respect to just the stop itself, is there? A. Any stop, even a good stop well planned, there is a hazard of undesired emergency. That is the hazard of handling this tremendous mass. It exists in perfectly planned stops.

Q. Which would you say is more hazardous to the members of the crew, stopping to go back and correct a malfunction on a trailing unit, or have the fireman pass over the catwalk while the train is in motion to do that? A. We have climbed all around on locomotives, I have, in steam and the early days of the diesel. We are familiar with that. We don't do that at the maximum speed. You reduce your speed, but you keep the train moving.

Q. On the locomotives that you operate, are there rails or bars on the ends of the catwalk? A. That is correct.

Q. Were they installed by your railroad company? A. That is correct.

Q. Do you know why? A. I don't know why they did, because the engines first had a walkway that folded down with chains where you could [552] safely cross, walk across much more safely.

Q. Those aprons or walkways were removed by your railroad company some years ago? A. Yes, sir.

Q. Do these rails or bars that you don't know what they are there for impede your progress when you are trying to pass from one unit to the other?

Mr. Lessenberry: He said he didn't know what they were there for, then he asked him why they were put there. There is a considerable difference in the question that Mr. Light asked and then contributed to the witness later on. I object to it, and think it is improper.

Judge Van Oosterhout: The present question, as I understand it, is to whether the bars impede his progress or not.

Mr. Light: Yes, sir.

Judge Van Oosterhout: He may answer.

A. They impede your progress of making a direct walk across there.

Q. Don't you think it is dangerous, Mr. Pelton, while the train is in motion to be out climbing over those bars and jumping to the next diesel unit? A. We don't, you don't climb over those bars and jump to the next unit.

Q. How do you progress around the bars? [553] A. A man holds onto a bar on one engine, swings his foot on the front platform, reaches the other bar, and before he turns loose of the other bar then steps on across; or he goes down the step holding on to a grab iron at all times, steps on the running board step, still holding onto a bar, reaches and gets the other grab iron on the other engine, steps on the other step, and then turns loose of the bar behind him, and climbs the steps on the running board of the engine he goes on.

Q. Mr. Pelton, is the reason that the fireman working with you violates this rule we have discussed, moves between units while the train is in motion, that you want to and they want to avoid a delay of the train? A. We want to avoid a delay to our train. We see company is trying various methods to have hot trains and quick changes in terminals, get the train moving, it is a competitive business, we know. We are not unrealistic, and our pay rate is an incentive pay rate. Plus the fact that in working with this equipment as we come up we don't

try to take deliberate chances. We are familiar with the equipment.

Q. Do you know the policy of your railroad company with respect as to whether it is willing to accept or tolerate a delay in the interest of safety? [554] A. In the interest of safety alone, yes.

Q. It is willing to accept delays? A. Certain delays, yes.

Q. Hasn't safety always been the first consideration in the operations of the Missouri Pacific Railroad Company, and didn't you so testify in Nebraska? A. I have, and I still say that safety is the prime consideration of railroading.

Q. Mr. Pelton, would it fair characterize your position in this matter to say that reducing the number of men on a train crew tends to slow down the operations? A. When there is no trouble, in other words, no defective equipment, no bad conditions, it wouldn't slow down. It is when you have the hotboxes and defective equipment back in the middle of the train——

* * * *

Q. Had you finished your answer about slowing down the operation? A. Under the total picture of railroad operation from terminal to terminal, day in and day out, I feel it would slow down operations. Not just one isolated incident.

[555] Q. Are you familiar with Rule 108 of the Uniform Code of Operating Rules? A. Yes, sir.

Q. What, in substance, does that say? A. Where in doubt or uncertainty, the safe course must be followed.

Q. Is it correct that that is the only rule in the book that is printed in bold face type? A. To the best of my knowledge, it is.

Q. There are what, approximately five hundred rules in that book? A. Considering the breakdowns of the various parts of the rules, there is far more. I would say that that was fairly representative.

Q. In switching operations when the engineer is taking signals from the man on the ground and the man passes from the engineer's view, what does the rule require the engineer to do? A. Stop.

Q. Is that a safety rule? A. Yes, it is. Well, it is an operating rule. It is not under the heading of a safety rule. It is an operating rule.

Q. Mr. Pelton, is the fireman and engineer's job under the [556] present operating conditions, are those jobs burdensome, hard jobs? A. The one-man operation in the bowl for an engineer is an operation that he has to keep himself constantly right on watching everything on all sides, everything he can see. And at times he has to become obstinant to the point of making somebody get to a position, or get him clear cut information as to what to do, whether he can move or not. Under those conditions the job does become, shall we say, aggravating, and to a degree, nerve-racking. When you have to fight to get the information you need to operate under the rule itself.

Q. Do you like your job as a locomotive engineer? A. I like railroading, I like my job as an engineer, yes.

Q. You don't feel you are overworked, do you, Mr. Pelton? A. Under some conditions, I am required to work under the law the full limit, full sixteen hours. Under those conditions, I wished that it was twelve hours or a little less.

Q. Is this a harder job that you now have than the one you had when you were trainmaster? A. The job allows me, harder in what way, sir?

Q. More difficult and more burdensome on you.

Mr. Lessenberry: I object to this kind of questioning.

[557] Judge Van Oosterhout: I don't see the materiality.

Mr. Light: It is submitted for this purpose. The testimony that is in the written document that has been filed——

Judge Van Oosterhout: I would probably be better to reserve the ruling. You are arguing the point.

Judge Henley: Is this covered in the other testimony that is on file?

Mr. Light: The other testimony from the Intervenors is to the effect that fireman and engineer have a difficult job, very demanding job, and therefore they are both needed to carry on the duties, and this is in response to that.

Judge Van Oosterhout: The question here is with respect to the work, comparison of the work to that of other trainmen. I don't think it is material myself. I am going to reserve the ruling, and let the witness answer.

A. I have lost the question.

Judge Henley: Is your present job as an engineer harder than your job when you were a trainmaster. You can answer that yes or no, and let's go to something else.

A. As to the decisions required on both the jobs, in the—physically, the job as engineer I do a little more physical work, but I still have that decision on both of them. I can't, act of decision in your function as an engineer, physically neither job is too hard to do. There is a [558] strain on both jobs, and the act of decision is required on both jobs.

Q. Let me ask this one final question on this, Mr. Pelton. Doesn't your present job as engineer permit you more time to lay off and go fishing? A. Yes, sir, it does.

Q. Thank you.—Mr. Pelton, has it been your observation that the new modern equipment on the trains that you now work with has made railroading safer operation than it was when you first came to work? A. Some of the improvements, all make it safer, yes, sir.

Q. Mr. Pelton, in the thirty-four exhibits filed by the Intervenors in this case there is testimony from members of Brotherhood of Railroad Trainmen and testimony from members of Brotherhood of Locomotive Firemen and Enginemen. You are the first witness in this case who is

a member of the Brotherhood of Locomotive Engineers. Can you tell me why there is no testimony in the case from members of the two other intervening organizations?

Mr. Youngdahl: We object, Your Honor.

Judge Van Oosterhout: Objection sustained.

Q. Do you know that your organization, Brotherhood of Locomotive Engineers has concurred with the carrier members in the report of the National Joint Board published in January, 1966?

[559] Mr. Lessenberry: I think, or at least I thought we were trying the Arkansas full crew case here, and the constitutionality of the statute. And this is the second effort of Mr. Light to interject some sort of labor agreement or arbitration.

Judge Van Oosterhout: Isn't all this material in the record some other place.

Mr. Lessenberry: If it is we object to that. Most of these objections go to some of the Awards that have been made, and we object to it here, or at least the Defendants do. It is not relevant.

Judge Miller: Well, it is in the record that the court considered without this question, it seems to me like. All of that is in the record, and that constitutes whether it was placed in there over your objection or not. It is in the record for consideration, if the Court wants to consider it.

Mr. Lessenberry: If it is not there, it should be there.

Judge Van Oosterhout: This would be repetitive, Mr. Light.

Mr. Light: This report that the Brotherhood of Locomotive Engineers concurred in is Plaintiffs' Exhibit 79, I believe, puts the Brotherhood of Locomotive Engineers on record with the position that their review of operations without a fireman indicates that the absence of a fireman has not contributed to any adverse safety situation on [560] the railroad. I asked Mr. Pelton whether he is

acquainted with this position of the organization of which he is a member on the issue of his credibility, he having expressed an opinion that he thinks a fireman is necessary to safety.

Judge Van Oosterhout: Well, let's move along. The ruling will be reserved.

Q. Do you know what position your national organization has taken on whether the absence of a fireman has contributed adversely to the safety of railroad operations? A. I have heard it stated here. I don't know the position. I haven't seen any of those documents.

Q. Mr. Pelton, when you testified before the Presidential Railroad Commission, how many men did you tell that tribunal you thought were necessary to safely operate a train? A. If I recollect, I felt that a full crew constituted a safe crew.

Q. As a matter of fact, weren't you there in support of the position that a five-man crew would be the size crew that should be used to safely operate a train? A. Not to my knowledge, I was not.

Q. Isn't that what the organization that you testified on behalf of was representing to the Commission? A. Not in the testimony I gave, that I was aware of.

Q. Did you hear some testimony while you were there to the [561] effect that a five-man crew was necessary to achieve safety?

Mr. Youngdahl: We object.

Mr. Light: I withdraw that.

Q. When you were working as an officer of the company in Missouri did you have jurisdiction over the White River Line that included the train to Cotter? A. Yes, sir.

Q. Were the trains that were operated between Nevada, Missouri, and Newport, Arkansas, under your jurisdiction? A. Not from Nevada, from Carthage. Carthage, Missouri.

Q. From Carthage? A. Carthage to Newport.

Q. Were you familiar with the practice of stopping or slowing the train at Crane and taking on an additional

man to take the train on into Arkansas? A. Which train are you referring to?

Q. I refer to the southbound train from Nevada to Newport. A. At the time that I was there, to the best of my knowledge, none.

Mr. Youngdahl: We object to the stopping of the state line on the ground that it is immaterial, and it has been decided by previous Arkansas cases. It is not being a burden on Interstate Commerce specifically dealt with in those cases.

[562] Mr. Light: I think the Supreme Court dealt with this res judicata already.

Judge Van Oosterhout: The ruling will be reserved.

Q. What was the practice of the train? A. At the time I was there the train, they changed their numbers, 69, I believe, or 169, this train came out of St. Louis and through Nevada and stopped at Crane and did some picking up and setting out and then progressed on to Cotter.

Q. Did it pick up an extra man at Crane? A. Well, the third brakeman went on duty at Crane. I mean, he was picked up at Crane.

Q. What were the differences in the operating characteristics of the railroad before the train got to Crane and those that it encountered between Crane and Newport? If any? A. Operating differences, of course the territory from Crane to Cotter was mountainous territory, but as far as the rail operation it was very dark rail operation all the way down.

Q. The characteristics of operation were generally the same before the train reached Crane as they were after it left Crane to get to Newport? A. That is correct.

Q. Have you ever had jurisdiction over Greenwood Junction? A. No, sir.

[563] Mr. Light: That is all, Your Honor.

Judge Van Oosterhout: I believe I have one question, Mr. Pelton. About what period did the change from

hand-firing coal to the stoker system develop. Do you recall about when that was?

A. Your Honor, I came to work in 1941, and at that time we had the heavy power, I mean that handled the big trains and we had stokers or oil burners. We still had lighter duty engines that were hand-fired. Now, I believe in Mr. German's statement he set forth that by 1920 the heavy power produced had mostly stokers. But, of course, I am only speaking of 1941 of my own knowledge. They would try to use engines equipped with stokers because they could make better running time, but during the start of war we got short of power. We had to use everything. As far as me saying when the preponderance of power had been changed, I can't give you a truthful answer.

Judge Henley: It was sometime before 1941?

A. Yes, sir.

Judge Van Oosterhout: And the change to oil, I suppose, came subsequent to that?

A. Well, in oil producing areas—this is my knowledge gained from talking to men over the country—on that score, if you were close to an oil field where the cheaper oil was [564] available, even a railroad might have some hand-fired engines and some oil burners. It depended on the fuel supply available.

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Redirect Examination,

By Mr. Lessenberry:

Q. Mr. Pelton, have you ever had any experience, have you ever been involved in an instance where an engineer became incapacitated while operating a railroad train?

A. Yes, I have.

Q. When and where was that? A. I believe it was in 1961 or 1962. I was on the Gurdon extra board. I was working a switch engine at Gurdon. Train No. 1, our

southbound Eagle train, came on the radio and said the engineer had keeled over and that the fireman was bringing the train on in to Gurdon from Gum Springs—Curtis, I believe. Some six or seven miles north of Gurdon. The dispatcher called me and told me to get up to the depot and be prepared to take No. 1 on to Texarkana, and I was there when No. 1 arrived there and helped to get the engineer, Tracy Norwood, off the engine, had the ambulance there and take him off, and then I took [565] the train on to Texarkana. He was unconscious when they got to Gurdon.

Q. Mr. Pelton, are you familiar with some of the operating rules of the other railroads to the movement between the power units at a slow speed? A. Only in having seen some of their instructions which men off the road showed me. They don't have any prohibition except that they slow down. That is my only knowledge of that.

Q. Do you know who establishes the requirements for employment as a fireman on your railroad? A. I do not.

Q. Mr. Light asked you a question about new firemen as opposed to an old brakeman. Is the brakeman always in the cab or the head unit of the locomotive? A. No, sir.

Q. Does he in fact have other duties to perform? A. Wayside station, during switching he is on the ground doing the necessary work of a brakeman, away from the locomotive.

Q. If you were relying on the brakeman to do something, he might be not even in the cab of the locomotive? A. As I say in wayside switching operations, twenty, thirty or forty cars, he could be that far from me.

[566] Q. You described a procedure to Mr. Light on his cross-examination in regard to a relay button when you received an alarm bell on your head locomotive. Is that procedure that you described to him a routine procedure of checking various components of the particular unit? A. Yes, it will vary with the different types of power as to what should be checked. There are certain basic things

common to practically any locomotive that has to be followed, or should be followed to keep—the thing about it, you reset say a ground relay. If there is some obvious thing there that is within the area of correction, you would want to correct it rather than have another operation.

Q. You described your vision that was available on certain diesel electric locomotives. Are you familiar also with the vision afforded the fireman that sits opposite you in the operation of those units? A. Yes, sir, to some degree. From a lot of the newer engines I haven't done a lot of looking out of the other side.

Q. Are they substantially the same as that described available to you? A. In some cases the fireman on the left side of the engine's vision is better because he doesn't—in some certain angles, because he don't have the speedometer and the control stand and all this various equipment located right close around him.

* * * *

[567] **Recross-Examination,**

By Mr. Light:

Q. Mr. Pelton, on this occasion where you met the train at an intermediate point and took it on in after Engineer Norwood had become incapacitated, did that train have a brakeman riding in the cab? A. No, sir.

Q. When was this? A. It is in the record, and I believe in 1961 or 1962. It could have been 1963. This was back when I was on the Gurdon extra board. I have the information at home in my time books, but I don't have it with me.

Q. This is the only time this has occurred to you assisting where an engineer became disabled on duty since you went to work in 1941? [568] A. That I was connected with or had direct knowledge of.

Q. Do you know whether the engineer when he became

incapacitated, whether the dead man pedal stopped that train? A. I have been told that it did not; the fireman stopped the train because this man was a very heavy man.

Q. Had the fireman not been present, would a brakeman have been on the train he could have done what the fireman did, couldn't he? A. He could have stopped the train in emergency.

Q. With regard to station switching, when the brakeman is not on the cab with you, you are moving in those operations only on the signal from the man on the ground, aren't you? A. That is right.—No, we start our movement on his, at some of the stations, and then we have to be ruled both by his signals and block signals that we are having to switch by, and come in contact with city, road crossings and city crossings.

Q. But when you are working with men on the ground who are passing the signals to you, you don't move until you get a signal from them. Correct? A. That is right, but he don't give me a signal—his signal will not allow me to pass a block signal. That is prohibited.

Q. This is a double safe procedure, isn't it? A. It is another cross check for safety.

[569] Q. You can't move until he has moved, and then you can't even move then if the block signal tells you not to? A. That is correct.

* * * *

(A model train is set up in the courtroom.)

[570] **MR. W. H. WILKERSON,**

being called to the witness stand on the part of the Intervenor, after being duly sworn, testifies as follows:

Direct Examination,

By Mr. Ross:

Q. State your name and address, please, sir. A. William H. Wilkerson, 418 South Miriam Avenue, Mile City, Montana.

Q. Mr. Wilkerson, could you speak up just a little bit. By whom are you employed? A. I am employed by the Milwaukee Railroad.

Q. Is this the Chicago, Milwaukee, St. Paul and Pacific Railroad? A. Yes.

Q. When were you first employed by that railroad? A. I hired out as a fireman August, 1941.

Q. Would you briefly give us your background in railroading beginning in 1941. A. I hired out as locomotive fireman August 26, 1941 on the Milwaukee Railroad at Mile City. I worked from Mile City and Harlowton, Montana, until the end of December, 1941, and then was transferred to Seattle, Washington, as a borrowed fireman for the months of January, February and March of 1942. I then returned [571] to Mile City, Montana, for about two weeks and then had to go to the Navy during World War II. I was in the Navy from April, 1942 until November of 1945.

Q. What were duties while in the Navy, Mr. Wilkerson? A. I was in the engine room service aboard landing craft. My rate was a Motor Machinist First Class. That pretty well parallels the duties of a fireman on a locomotive in that we were in charge of maintenance and operation of the diesel engines that propelled the ships.

Q. These were diesel locomotives in these ships? A. Yes. They were—some of the landing craft had exactly the same type diesel engine as General Motors 567. Others had Fairbanks-Morse and Cooper-Besmer, all of the major diesel manufactured produced power of the requirement needed on the ships.

Q. You mentioned GM 567 motor. Is this a motor which is used in the locomotive built by General Motors? A. Yes, it is. The 567 diesel engine was produced by General Motors, I believe, for twenty-seven or twenty-eight years from about 1938 until last year.

Q. Your job in the Navy was to maintain diesel engines

then. Is that correct? A. Yes. Maintain them and also to operate them while a ship was in transit.

[572] Q. All right. Continue with your background, please. A. When I returned from the Navy in November of 1945 I went back to work as a fireman at Mile City. During my absence two men that are younger in seniority than I am had been promoted to the locomotive engineer on August 3, 1945. Under our promotion rules it is necessary for me to have three years of actual experience and pass three examinations, first, second and third, which are progressive examinations, and if I successfully pass the third examination than I can climb the date in accordance with my fireman seniority date ahead of the man that is just younger than I am. So therefore I knew right from my return that it was going to be necessary for me to study and study very hard, because as I say I had quite a bit to lose had I failed the examination, and I am happy to say that I did pass the examination, and my date as an engineer is August 3, 1945. Had I failed the examination I would have been given a second chance at the expiration of six months, but any men promoted during that time would have been senior engineers to me.

Q. What other instruction or training do you have concerning the diesel engine? A. When the diesels first started showing up on the division that I hold seniority was in 1947. Our first diesel locomotives [573] were in passenger service on our Olympia and Hiawatha trains. I was able to hold the job firing on one of these diesel passenger trains right from the start, not necessarily because I had the seniority but because many of the older men did not want to get off the steam engines, and therefore I was able to hold the diesel passenger job when the older men than I was were firing freight service. Also, we had considerable instructions, we had both company representatives, we had traveling engineers, traveling firemen. Milwaukee, like a number of other roads, it was a

complete change from the steam operation to the diesel operation, and even our local officials had little or no knowledge of what the diesel engine was or what you had to do on it. About this same time my friend, Kenneth Clark, took an international correspondence course on the steam locomotive on his GI Bill of Rights, and after completing the steam course he also enrolled in the diesel course. About the time that he started taking the diesel course, our first diesels began to show up. So he would study his instruction books, and when he was through with a lesson then he would give me the book and I would study it. I kind of took the course second-hand from Mr. Clark. Also, at that time it turned out that Mr. Clark possessed the best knowledge and the most accurate [574] information on the diesel engines, and it wasn't uncommon for even the master mechanic to consult with Fireman Clark to find out different things that were going wrong. A lot of the failures that we had at that early period are nothing that a fireman and engineer don't correct every day now, because of the lack of knowledge at that time, they were a major failure, and many times it had to be pulled in by steam locomotives. Also, because we had very few instruction manuals, about the only manuals that we had at the time were entrusted to a traveling engineer or master mechanic and so forth, so I began to take pieces of paper, usually the back of a work report, and draw off my own manual and wander back through the units usually with a traveling fireman or traveling engineer and note what contactors were in place, which ones were opposite a different sequence we were running in. Then we finally began to get more accurate information from the company. They also finally sent around an instruction car that visited every terminal, and for the next two years there was extremely good instructions, I would say, on the diesel locomotive.

Q. You have taken advantage of all these instructions that were available to you? A. Yes, I have.

[575] Q. And are you presently operating as an engineer? A. Yes, sir. Since 1961 I have had seniority enough where I work the year around as an engineer.

Q. What is your union affiliation, Mr. Wilkerson? A. I am a member of the Brotherhood of Locomotive Firemen and Enginemen.

Q. Do you hold an official capacity in that union? A. On Milwaukee lines west I hold the office of General Chairman, which is a part time office.

Q. Mr. Wilkerson, using your flock board here and props will you show us the parts of the diesel electric locomotive and how a diesel locomotive functions? A. Yes, I will. We have found that for the most part people do not understand what the diesel electric locomotive is, why it was built the way it was, what components are needed to keep it operating, what can go wrong with them. So for the purpose of illustrating I have made some drawings here. I have put on the flock board to show the Court exactly how a diesel engine is constructed. Several places you will have to use your imagination, and some of the drawings on here are for illustration purposes more than to show the accurate construction.

Q. In those instances when you are speaking of them, will you point out what they are for illustration rather than parts actually found on the engine? [576] A. Yes, I will. What I have placed on the flock board is a drawing of a General Motors 567 CRD engine. It shows the round inspection hole. Engines that were produced before this model had the square inspection plate, but basically the same engine was produced for twenty-eight years. They have an 8½ by 10 inch bored stroke which means that the diameter of the piston is 8½ inches across, and the distance it travels down is 10 inches. They were able to increase the 16-cylinder version of the engine from 1350 horsepower to 2500 horsepower during the 28-year period. Now, this is known in the mechanical world as a two

stroke cycle engine. Therefore, at the rear of the drawing I show three exposed cylinders to show the different phases of the two stroke cycle engine. The rear one as you will notice the piston is to the extreme bottom of the travel, and as you can see along the side of the cylinder wall are what is called intake ports. I have also tried to show that the fresh air is flowing into the intake portions of the cylinder. As the crankshaft would turn, of course the piston would rise above the intake ports, and when it does it cuts off any escape, and the air that is trapped in there has to be compressed. The compression ratio on the diesel runs from approximately 14½ to 1 to up around 20 to 1 compression ratio. As the air that is trapped inside is compressed, it also heats up until when the [577] piston is at the extreme top and the compression ratio is present would be 16 to 1 the heat is great enough so that fuel sprayed into this compressed air automatically starts to burn.

Q. Does the diesel engine have an ignition system? A. No, it does not. All that it has, like I said, the heat generated by compressing air to such an extent that it is hot enough so that it is far above the firing point of the diesel fuel that is sprayed into it. The minute the diesel fuel is sprayed in, of course, it starts to burn, and as it burns the air begins to expand. As it expands it drives the piston down in the cylinder, and in the third drawing we have tried to show the burning fuel, also the valves on the top of the cylinder head have opened and the exhaust is going out. Now this happens just a few degrees before the intake port is uncovered, because you want to release the pressure in the cylinder before it goes down. Otherwise, the exhaust would be blowing into this air manifold. Any time that you have any moving parts in an engine or anything else, you are going to be encountered with friction. The diesel engine, like everything else, uses lubricating oil to reduce the friction. The lubri-

cating oil has two other purposes. It also cleans and it cools. Also, where you have fire in the cylinders you have to have [578] cooling water, the same as in an automobile. And I have tried to show the cooling water around through the jacket and everything out through the head. This is shown in green. The red line here represents our fuel system which is an individual injector system on a full flow-by fuel system as it is known. Now, for the purpose of illustration we will put the fuel system in—we will first have to have a fuel tank, diesel fuel tank to store the diesel fuel in. It is located on the diesel engine underneath the frame, so we will put that under the diesel engine that we are showing here. Now, we will put the fuel pump in approximately this position. I will give you a brief run down of how the fuel is used in the diesel engine. The first thing is the emergency shut-down valve in case of fire or anything. Here we show the fuel pump, in the case of these engines it is an electrical driven fuel pump. It pumps the fuel out of the tank, through the emergency shut-down valve, through the suction filter, and then sends it under pressure to what we call the pressure filter. After it comes out of the pressure filter it comes up the side of the engine in the header to two more filters which are classed as center bronze filters. They are very fine filters for removing very small——

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[579] A. You are certainly invited to ask any questions to help clarify any situation.—As I said before, we have two center bronze filters, then the fuel comes through the fuel header out to each individual unit injector, as they are known. You will notice that here we show one type that comes from the delivery line up to the unit injector. Also we show fuel going around the unit injector and back to the discharge center that runs across and back down to the tank. Now as I said before, we pump approximately 75% or 80% more fuel through this system than what is

needed for combustion purposes. The reason for that is that we have to cool these injectors and we have to lubricate them. Now to insure that we have the proper fuel supply in our header up at the front of the engine we show a glass with the number 5 in it, sight glass. The fuel flows through this return header, underneath the glass there is a restricter which causes the five pound pressure to be maintained all along the system. After it flows through the restricter then it returns back down [580] the pipe to the fuel tank. Now if these center bronze filters become plugged, we show a 45 pound sight glass immediately under the five one, and when it gets to the point where the fuel cannot be forced through these filters, a by-pass will open and fuel will show in the 45 pound sight glass, and it will be returned to the tank, being up around here.

Q. What is the significance of five pound and forty-five pound sight glass in the operation? A. The two sight glasses are visual indicates to a fireman, when he looks he can pretty well tell what his filters are, if they become plugged, if the center bronze filters which are capable of removing very small particles are plugged to the extent that 45 pounds of pressure on the fuel will not go through them, then it backs up and goes through this fuel sight glass. This sets up a pretty dangerous condition. As I said before, the clearances on the injectors are so small that they are hand lapped on the plunger to make a very close fit because they have to force the fuel into the cylinder under extreme pressure. Therefore, if you don't have enough fuel going through it will score the injector, and it will stick. Also, you will get a burning of the tip and other parts of it. So any time you show fuel in the 45 pound sight glass you correspondingly have [581] less fuel in the five—maybe no fuel at all, which would show you that you are in trouble on your fuel system. We will get back with this a little bit later. I have

some other stuff here. I want you to understand that this is an extremely dangerous condition when the fuel is showing in the 45 pound sight glass. When you have an engine the size that these are, as I said before, we use the lubricating oil both as a cleaner and as a cooler as well as to reduce the friction inside of the engine. So as long as it is cleaning it is necessary then to put filters on. Now you can see as the oil is pumped through the header along the side it is poured off, we will call it, which is merely through holes drilled at different places. You can see here we show a port that comes down to a main bearing. Then as you can see, we show that it has been drilled up through to the connecting rod bearing. Also, from the connecting rod bearing it is built up from the connecting rod to the piston pin, and here it is splashed onto the side of the walls. Also, it lubricates, cools, the underside of the head. Of course, after it escapes onto the walls and drops back down to the bottom of the pan where it is picked up again by the lub oil pump. The scavenger pump, as it is called, delivers the hot dirty fuel over here to the lube oil filter. After [582] it is cleaned it comes up through, and now it will be necessary for us to cool the oil. So we will install this drawing to represent the oil cooler. Now as you can see the oil comes through what is more or less of a radiator, drains down and into an oil pump. This pump picks it up and sends it back to the engine for lubrication and cooling purposes again. As long as we are cooling the oil with water it wouldn't take very long before our water would be boiling hot and turn to steam, and we would be in trouble again. So what we have to do on this as well as any other engine is install radiators which are located about the engine, above the engine. First we have to have a water supply tank. Now we have a complete system. The water is stored in your water tank that flows through the cooler, the oil cooler, picked up by this pump and pumped into both banks of

the engine where it circulates around the cylinder liners and out through the head and back up into the radiator where the heat can be transferred to the atmosphere. We also have shutters on the front of the radiator to control the flow of air through the radiator. They open and close. Evidently, I don't think I mentioned, this is sixteen cylinder V-type engine. This is eight cylinders on each bank. Now as we could operate this way for a limited time, whatever it would take to get our water hot, the [583] hardest thing to do and what they have done in all cases is to put cooling fans on that are either mechanically driven or they are electrically driven. In the case of General Motors that we are talking about, they have for the past number of years had an electrical cooling fan. So they put the cooling fan immediately above the radiators. Now, the cooling fans, of course, can suck the hot air out and draw in cold air, too, and keep the temperature operating exactly the way that you want it. As we have shown, electrical cooling fans, it will be necessary for us to have a generator or some source of power to run our electrical motors. Now, these are 170 volt alternating current motors. So what they have done, they have built an alternating current generator and connected it right to the crankshaft of the diesel engine at the rear. Now, what you have on the flock board now is supposedly a diesel engine that can continue to run for any number of hours in case you have a fuel system, lubricating system, you have your cooling water system, and you have a method of transferring the heat from the cooling water to the atmosphere. Now the purpose of the diesel engine as manufactured, of course, is to propel anything. In this case, we want to propel a locomotive with it. It can be done either by mechanical means through gears, drive shaft and so forth. It can be done by a [584] hydraulic medium, or in the case of the diesel electric locomotive it is done with electricity. So what they have done, they

have built a generator that they classified as 600 volts direct current generator to this model, and it is also connected directly to the crankshaft of the diesel engine and turns the turns the speed that the diesel engine turns. While this is classed for all purposes 600 volts, voltage rises to above 1,000, and drops to, of course, zero. The main purpose of the generator is to be a constant power output for any given throttle latch on the diesel engine. As I said before when I first started explaining, the fresh air flows into the cylinder for the purpose of combustion. Now they found out early in building two stroke cycle engines that there is much advantage to be gained by putting the air in under pressure. So for this reason, we will install what they have classed a root type blower. This blower is driven by the gear train from the diesel engine itself, and delivers a large volume of air into the air box at approximately five pounds per square inch pressure. Now you can readily see that more air will flow into the cylinder during the time that the piston has uncovered the intake port if the air is under pressure than it would if it was only atmospheric pressure. It makes a much more efficient engine operation. Also, [585] at this time you will notice that we have colored certain portions of both of our generators in orange, and labeled them 64 volts direct current. That is because these generators are built on what is called external excited fields. We use the battery current, which is 64 volts, to excite the fields of the generators that we are using. In order to maintain a constant supply of 64 volts current we will install an auxiliary generator which will drive off the gear train of the diesel and we will show that as being put behind the root blower. Of course, at the same time we will put in a battery above there just for illustration purposes, because when the generator isn't running we still have to have 64 volts of current to start our diesel engine and to run the fuel pump. On these the fuel pump has to be run-

ning to build up a supply of fuel in the header before we can start the diesel engine. Now, when we have externally excited fields we have to have a method of controlling the amount of excitation that we are putting into the field, otherwise you would have a maximum field condition at all times. The strength of the magnetic field between one field and the other could be so great that the diesel engine wouldn't be able to turn the armature through it. So to regulate that they have built what is classed as [586] a load regulator which is a movable thing that cuts in or cuts out resistor in the battery current supply to the main generator field. This will allow the diesel engine to maintain whatever throttle position the engineer is set for. For instance, if he wants to run at 600 revolutions per minute your load regulator will back off, cutting in more resistance into the battery field until the strength of the diesel engine will be such that it could maintain the 600 rpms that the engineer is calling for. Of course, if you wanted to run it 700 or 800, it does the same thing. The load regulator varies the amount of current coming from the main generator in proportion to the strength of the diesel engine. Therefore, if you have a new diesel engine with good compression and everything you will be putting out more current than one that is pretty badly worn. Now, of course, if you are going to use electricity the power of locomotives will have to have a way of interrupting the flow of motors that are going to supply the power to the wheels. This is done by what we call a power contactor. We will have to have a high voltage cabinet. Also along with a high powered contactor, you will have to have a reverser so that we can make our locomotive run in either direction. Now the way that the electrical power is transmitted to the wheels of [587] a diesel electric locomotive is through traction motors that are geared directly to the axle, and of course the wheels are mounted on the axles. We will put the truck approximately in this position, and

then we will put a traction motor which is colored in red here in the position that they are actually on the locomotive. One end of the traction motor is held onto the axle through which we call suspension bearings, and the other end is held on to the bolster. That allows the traction motor to move up and down with the wheels. Over rough track you couldn't have a traction motor to where it wouldn't be able to move. So that is the way they have accomplished that. Of course, then we will have; have to have a transmission line. That is a kind of loosely built locomotive. You have to bear with it. Now, we have installed transmission lines, leads to the traction motors and you can see the current would come out of the main generator, flow over here to the high voltage cabinet to the power contactors and reversers, down into the traction motors. These traction motors are straight series wound direct current motor. In order to get high starting out of them it is necessary to put considerable amperage to them. On the power contactors you will notice I show three switches, P-1 and P-2 which are shown as open, and S-12 [588] which is shown closed. Now this stands for parallel and this stands for series. In this case where S-12 is closed, half of the power from the main generator will flow through the transmission line, go down through number 1 traction motor, go back up and through number 2 traction motor, and then return to the generator. This pair of traction motors will be parallel with the pair on the other truck as we can put in place approximately where it would be on the locomotive. This is called the series parallel hook-up, and we will have more to explain about that at a later time. All that we are trying to do here is to show you approximately the path that the current has to follow in order to flow through the traction motor and back up to the generator. Now, of course, we have to have a method of controlling our switches and our reverser, and this is done with the same 64 volt battery current that

we use to excite the fields, and we will put the engineer's control in a position approximately here. This small square represents the engineer's control in the cab. Here we show the throttle and the forward and reverse lever, and the transmission lever, various buttons, amp gauges and so forth. Also you will notice in the high voltage cabinet we have shown the bottom part of P-2, S-12, P-1 and the reverse and [589] forward in the same orange color to show their low voltage, 64 volts. That will be controlled from the nearest control stand. Now, of course, we have a method of reversing the locomotive, but the only method we have of stopping it would be to break the flow of current by opening the switches, and, of course, on the downhill grade that wouldn't be much help to the engineer. So what all American locomotives use, they carry an air compressor of compressed air. We will attach our compressor at the end of the 600 volt main generator to drive off of the crankshaft of the diesel engine. It turns at the same speed that the diesel engine turns, and when you don't want it to compress air they have what they call an unloading device that locks open the intake manifold, intake valve. Of course, when you compress air in a compressor you get the same thing as what we are utilizing in the diesel engine. By compressing air, you run into heat. Where we want the heat in the diesel engine, we don't want it in the compressed air for our air system. So this air has to be cooled. We will install an air cooler directly above the compressor. Actually there is considerable more pipe than that. This is for illustration purposes. We also have to have a compartment or tank to store the [590] air that we are compressing. So we put a compressed main reservoir, a compressed air storage tank approximately in this position. Now, our objective is to admit air into the brake cylinder that is located on the truck where the piston will move out and force the brake shoe up against the wheel, which will

stop the wheel. So we will install a line from the main reservoir down to the brake cylinder, for illustrative purposes only. Now we also want to give the engineer some way to control the amount of air that it put down there, so we will put a brake valve approximately in this position which would be within reach of the engineer in the cab of the locomotive. Now, we also have a heat problem with the traction motors when you are passing anywhere from 900 amps on down to a traction motor which is going to generate considerable heat. Then to take care of that we will install air blowers in this position. They are also operated by the alternating current generator to blow air continuously down through, as you see, the colored, around the field. There is also air space around the armature, so that the air can get in there and blow the heat away. That heat breaking down the installation is about the only limitation on those traction motors. Now, of course, all of the air that is drawn into the engine contains dirt and other [591] particles, so there is an elaborate air system on there. Just for illustrative purposes we will show this air system. That would basically represent the engine that we are showing, the yellow one, GP-9, General Motors electric motor. As I said, there have been considerable improvements made of it. One of the biggest improvements in the last few years has been the fact that they have gone to the turbo-charger to increase the amount of air that they could force into the cylinder, which in turn increases the amount of fuel that can be burned, and of course the amount of fuel, the more fuel you can burn increases the power of the engine. That is one way they have been able to raise it from 1350 up to 2500 horsepower. But the turbo-charger is basically the same as the blower, with the exception that it operates from your exhaust gas through a turbine the same as on an aircraft engine, and the air is compressed usually by two or three stage turbine the same as on a jet engine on an aircraft.

Of course, here again when we are compressing air we run into our heat problem. Therefore it is necessary to cool the air that we compress. In this case we show a water cooler in there, which is nothing more than a radiator, that operates from the same cooling system that cools the diesel engine. However, [592] now instead of putting the air into the air box at approximately five pounds, we are putting it in the air box at approximately eighteen to twenty pounds per square inch, which gives considerable more power. Of course, we will put the air filter back on to keep any of the foreign particles out. That pretty well completes our illustration. If there is any questions I will be glad to answer them.

Q. This is basically the engine that operates the GP-9 locomotive, the model which is the yellow one? A. That is correct. Most of the components that I have drawn up on the flock board are approximately the same scale that fit on the yellow model. For instance, the diesel engine would be housed in that approximate position. And the generators would be behind here, the oil cooler and oil filter are located ahead. The only thing that we have done differently there, we have put the air compressor on the back side—it was on some of the earlier models, S-7 and S-9—where with these GP's the air compressor has been moved back to the back end of the hood, a long extension shelf. Because of the illustration I have there of the filter, I have put it in the proper position. The same holds true with the trucks. Each truck is approximately the same size as those you can see on the yellow model.

Q. What is the scale of the yellow model? [593] A. The scale is constructed two inches to the foot.

Mr. Ross: Perhaps enabling everyone to hear, Mr. Wilkerson could return to the stand, and Mr. Clark, who is also familiar with the model, could stand at the model and illustrate whatever Mr. Wilkerson designates from the stand. If the Court desires, Mr. Clark may also be sworn.

Judge Van Oosterhout: As a better precaution, he had better be sworn.

(Mr. Clark is sworn, and takes position at the engine.)

Q. Mr. Wilkerson, who constructed the two locomotive models that appear here in the courtroom? A. Mr. Clark and I constructed both of them.

Q. I believe you said they were on the scale of two inches per foot? A. That is correct. Also, they are only half of the locomotive to each one. They are spit right down the center, and for the purpose of shipping them and everything we have also split them where we can fold both halves together and put in the case. These models mostly show the electrical circuit of the diesel electric motor. As you look at the, for instance, Diesel 1960 which is the DC-9.

Q. That is the yellow one? A. Yes, sir, the yellow one. That looks exactly like the [594] real locomotive with the exception that on each journal box there are four small lights. Now we use the four lights to show how the current is flowing through the traction motors. There would be absolutely no advantage to try to turn the wheels because why you might be able to see the wheels turning it wouldn't convey the message that we wanted to illustrate. The lights, incidentally, are for series parallel, for straight parallel, and on the top row we have——

Q. Is this for the different phases of transition of the traction motors? A. Yes, it is. Then we also show the traction motor shunts, and the fourth light is for dynamic brake, which is an electrical retarding brake. It is used on these types of locomotives. Most generally it is used in mountainous territory where you have long descending grades.

Q. Are the control panels on these locomotives located in the regular positions that you would find them on a real locomotive? A. No. They are located approximately the same position, but for illustrative purposes we have had

to turn many of them 90° because, for instance, the low voltage control cabinet and the high voltage is on the panel to the back of the cab of both types of locomotive, and it would be [595] impossible to even see the lights if we built them in the exact position they are supposed to be in.

Q. Are the doors on the side of the locomotive doors which appear on the real locomotive? A. Yes, they are.

Q. They are in the same position? A. They are right to scale, with the exception that we haven't put any locking handles on them. Also the hand railing and the walkway, the radiators, dynamic brakes and everything else is in the same position exactly to scale.

Q. Some locomotives are not equipped with dynamic brakes? A. Yes, that is true. It is an optional auxiliary, I guess you would call it, that some railroads in your flat country you have no need for dynamic brakes, while other railroads that are operating in mountainous territory, like I say, where they have long descending grades, they are absolutely essential.

Q. Can you illustrate with this model the transfer of power from the diesel engine to the traction motors using the model? A. Yes, we can. As I say, it is done with the lights and switches, relays. What we have done with the models, for instance, on the yellow 1960, we had to duplicate three separate systems, and we have done this all with one 12½ volt alternating current system. In fact, we have got to the [596] point where we have got so much power drawn off of the transformer that we can't operate with the lights on. So we will have to leave the lights off.

Q. Would you demonstrate for us then using the model, the transfer of power from the engine to the traction motors in the operation of the train, the locomotive. A. All right. It will be necessary to open up the doors in the cab. Now as you can see the side of the cab has been dropped down. Of course, this don't happen on a real loco-

motive, but as I explained, this is for illustrative purposes only. Now if Mr. Clark is ready we will point out the features of the controls. Would you indicate to the Court where the throttle is? Now, also the transition lever, and the reverser. Now, if we are going to operate a locomotive in multiple units operation you have to have master controls will be in the operating cab, and the individual unit controls will be in to make the units responsive to the master controls. What we do is on every unit the individual unit controls will be in, and here again they are not in the place that they would be on the real locomotive. We show them on the drop side of the cab where actually they are on the bulk head between the cab and the engine room, approximately that position. Now, Mr. Clark, if you will cut in the controls. (Lights flash on.) As you can see, the [597] minute Mr. Clark put in the controls, a number of lights lit on both units. To start with we will show one unit operation using the yellow model, 1960 only, and then we will show a multiple unit operation. We will also show how you can operate from either unit, and we will show some of the malfunctions that do occur and what can be done to correct them. Now as I explained on the flock board, these locomotives start out with traction motors in what we call series parallel hook ups. While I showed S-12 here for 1 and 2 together, that was merely for illustrational purposes on the cut away truck. On both of those locomotives we have made models of the current flows through traction motor number 1 and then through traction motor number 4 and back to the generator, and the other half of the current flows through traction motor number 2 and back to number 3 and then to the generator. So that you have S-14 and S-23 in parallel with each other, which gives a series parallel hook up. We show on here manual transition——

Judge Henley: Let's talk about a series parallel hook up for a minute, if I may. Does this mean that you hook two of these motors in a series to get additional power?

A. That is correct.

[598] Judge Henley: And then put two such hook ups parallel?

A. Yes. We show and use the old manual transition, which on the earlier locomotives this transition was made by hand, the engineer had to shift the transition lever to 1, 2, 3, or 4, depending on what his load meter showed him and the speed of the locomotive.

Q. What is the speed range of those transition steps? A. Well, on a locomotive such as that with a gear ratio of 62 to 15, the top speed of the locomotive is 65 miles per hour. Your first transition would take place approximately at 19 to 20 miles per hour, and the second transition would be twenty-nine to thirty miles per hour, and the third transition would be a little over fifty miles an hour, I think fifty-two miles an hour. On these later locomotives this is done automatically through what we call a voltage rise. When the voltage gets up to a pre-determined point, then transition takes place through quite a complicated procedure. The reason for the transition is that as any electric motor, the armature starts to rotate, it also starts to produce a back pressure, as we call it, the proper name is counter-electromotive force, and the faster it turns the more power that is being fed into the motor, and of course the back pressure that is built up, until it gets to a point where it is not economically advisable [599] to try to push more power through it, because on the design of a diesel electric locomotive the size of the generator is limited. So when this point gets to a critical stage what the engineers have done, they have put resistance in the fields of the traction motor, we call that shunting. When—that reduces the power in the field and lets the armature build up faster, and of course when you put resistance in a certain amount as the armature builds up, pretty soon you get back to the same situation that you corrected. Some locomotive manufacturers go on with several different shunts of varying strength. On both of

the locomotives that we have made models of, when they get to approximately thirty miles per hour they have found that it is much more economical and advantageous to go to a straight parallel hook up. So they have to change the wiring arrangement by dropping out certain switches, series switches and picking up the parallel switches, and that puts each motor in parallel with the generator so that it gets the advantage of the extra voltage that is needed. Now, to start out with we will show how the GP-9 locomotive would start in straight series. Now Mr. Clark has moved the reverse lever in the cab to forward position. He has moved the transition lever to number 1 position, and then he has pulled the throttle to number 1 position which sets up the power or [600] the excitation, and as you can see, immediately the lights lit up on the journal boxes. There is one light lit on each journal box. As you will notice the orange lights are on number 1 and number 4 and the green light is lit up on number 2 and number 3. So you can see the course that the current is flowing, it is flowing through traction motor number 1 and then on through traction motor number 4 and back up to the main generator; and the other half of the current is flowing through traction motor number 2 and then traction motor number 3 and back to the main generator, which is straight series. Now, to increase the speed of the diesel engine, of course in this set up the diesel engine is idling at 250 revolutions per minute approximately. To increase the speed of the diesel engine it is necessary to use electric control. Now the total increase is handled by the governor and it is also handled with three increasing solenoids and one decreasing solenoid. They are set for 75 to 80 rpms increase. Now Mr. Clark if you will move the throttle to number 2 position (Mr. Clark moves throttle). As you will notice in the back cabinet a light is lit up. It is labeled "A". It can't be seen from here, but that represents the "A" solenoid. That would increase the revolutions per minute on the

diesel engine 75 to 80—depends on what it is set at. Now if you will go to number 3 position. [601] You will notice that the "C" solenoid, next to the bottom one, has come in, which increases approximately 150 to 160 revolutions per minute. Now as the throttle comes out to number 4 you will see that both the "A" and the "C" are in, which is 150 plus 75 increase. Now you come out to number 5 position you will see that the "B" solenoid the "C" solenoid and the red one at the bottom, which is the "D" solenoid, are in. The "D" solenoid is a reducing solenoid, which reduces the 150 rpms. Now as you go to number 6 position, you will see that all of them are lit. The "D" solenoid remains in, which is reducing down. Now as you go to number 7 position you will see that the "B" and "C" solenoids are in. The "A" and the "D" solenoids have dropped out. And then in the 8 throttle position all three advancing solenoids are—increasing solenoids—are in, which gives you the maximum speed on that locomotive, approximately 835 rpms.

Q. The locomotive has been through all the transition periods? A. No, this locomotive would be in the position of starting a heavy train it is still in transition number 1, and what you have done there is increased the power that comes off the main generator by increasing the revolutions per minute that the diesel engine turns it.

Q. The locomotive is ready to move now? [602] A. The locomotive would be moving now.

Q. It would be moving? A. Yes.

Q. Would you take us through the area of transition and indicate what is taking place, the things that do go wrong with the locomotive or the malfunction in the transition and indicate what would have to be done in case these malfunctions did occur. A. Well, we will go through the normal transition first. As the speed of the train increases, of course, you run into the back pressure on the traction motors which I explained previously. The engineer is now up to approximately 20 miles per hour

and the back pressure is built up to such an extent that it is necessary to put the first shunt into the line. As I said before, we do this with the old hand lever. So, Mr. Clark, if you will move it to transition number 2.

Q. Transition on this model is usually done automatically rather than with the hand lever? A. Yes, it is on these models. Now, as you will notice the red shunt light is lit up on each journal box. We are now in number 2 transition, which is called series parallel shunt. This, of course, would allow the locomotive to continue to pick up speed until it reached approximately 29 to 30 miles per hour, and then the back pressure is built up to a point again where it is desirable to either [603] put in more shunts, or as we do on these, we change the wiring set-up to parallel. If you would change to number 3 now. Now you notice that when Mr. Clark went from number 2 to number 3, the lights that were series parallel and the shunt lights all went out. We use toggle switches in the compartment immediately behind the cab to represent the power contactors, and of course these are operated by hand. It was necessary for Mr. Clark to change the position of them to drop the two series contactors out and put the four parallel contactors in. Now this is one of the major causes of trouble in the locomotives themselves when they fail to make transition, as we call it, when they fail to go from series parallel to parallel at the proper speed, the back pressure on the traction motors continues to build up the faster the unit is being propelled. If it is a single unit it won't propel itself very much faster, but if it is a multiple unit the other units will continue to build up the speed considerable, and as they do, of course, the generator is not powerful enough and the diesel engine is not powerful enough to force additional current down. So you begin to lose power, and it backs off considerably until up at operating speed your generator won't be putting out enough power to hardly pull the locomotive itself.

[604] Q. This is on the locomotive affected by the failure to make transition? A. That is correct.

Q. Single unit operation? A. Multiple unit. In single unit operation you would have the same condition, but your locomotive won't increase much beyond approximately 35 miles per hour or something like that. You would know right away if you hadn't made transition because you wouldn't be building up the speed that you need unless you were on a downhill grade, of course. Now, as we get back to our traction motors, even in parallel the back pressure continues to build up on them until we reach approximately 52 miles per hour on that gear set up. Then again we would have the same condition that we had when we first started out, and we correct it with the same method. We put the shunts back in there, the very same shunts.—Would you go to number 4.—Now you can see that we are in what we call parallel shunts. The shunts have been added into the field and this will allow the locomotive to continue to build up speed to the maximum permissible of 65 miles per hour.

Q. What has to be done if the locomotive fails to make transition? A. If the locomotive fails to make transition, there is several things that can be done. The most common thing, if the [605] locomotive is equipped with traction motor cuts the fireman will go back and, of course, after a few years of experience, he can tell the minute that he steps onto the locomotive by the sound of it that it is not putting out power, although the engine will be speeded up the same speed that the other engines are. So what he does is take the unit off of the line and cut out a traction motor, then puts the unit back on the line, and this automatically through the cut out relay puts the engine in the parallel position. These traction motors are of such capacity that any three of them will take the full load of the main generator without causing any trouble to them. Mr. Clark can show you cutting

out a traction motor. (Mr. Clark illustrates.) As you can see, Mr. Clark has cut out the number 3 traction motor and the light has gone out. This would, of course, automatically put the locomotive in parallel. Most of the firemen though prefer to use all four traction motors, and they merely block in the COR relay, which is the cut out relay, and it does the same purpose that would do in case the traction motor was cut out. That is the very purpose of the relay.

Q. The locomotive would then make transition? A. It would be in parallel.

Q. Any other malfunctions which occur in the transition phase of the operation? [606] A. Well, we have a number of things that will cause the same thing. For instance, power contactors will hang up, as we call it, or fail to drop out. When you are passing the amount of current through electrical switch or contactor that goes through these contactors, any time that you make or break the connection you have considerable arcing, and also if the contactor isn't up tight there will be arcing, which will cause about the same thing, as spot welding, and that will hold the contactor in place. Now, the heart of any electrical piece of equipment, such as the locomotive, is the interlocks. These are merely switches on movable portions of any other switch to insure that you don't have conflicting switches coming in at the same time. For instance, on a power contactor such as when the series contactors are in, before any excitation can take place the current has to flow through interlocks that are on the outside, or the down position, I guess would be simpler, of the parallel contactors. This, of course, insures that you can't have both series contactors and parallel contactors in at the same time. On the same token, before the parallel contactors can come in, the series contactors have to drop out, and when they drop out the interlocks on them permit the excitation current to go through. And also there is a picking up of the

parallel contactors. What they are are safeguards. There [607] is also interlocks on the reverser, there is interlocks on the starting contactor, and a number of other relays.

Q. In the multiple unit operation, can the engineer stop the train and locate the unit failing to make transition? A. No. On any of the trouble that is related to transition or, as we term it, any excitation trouble, the throttle has to be out and everything set up for power, the same as is shown right there, because the minute that the engineer would shut off and stop the locomotive, shut the throttle off, then all of the systems are dead by the very design of them. Everything drops out, and, of course, he can go back through all of the different units and everything would be dropped out. There would be no way to tell which one was the bad unit. The only way that anything on excitation can be discovered and corrected is for the fireman to go back while you are under load and, of course, it is a very simple matter then to tell which unit is putting out power. There is an amp gauge on the control stand of each of these units, and the fireman, when he gets into the cab, can look and see how many amps it is putting out, and, as I said before, even before you get into the cab you become accustomed to the sound of the engine. You can tell whether it is working or running under no load at all.

[608] Q. Mr. Wilkerson, we have had testimony about the alarm system of a locomotive where a certain failure of the locomotive will cause an alarm in the cab of the engine, cab of the lead unit of the engine. What malfunctions will cause an alarm? A. We have the low oil that will give an alarm, we have the hot engine that will give an alarm, and we have the ground relay that will give an alarm. Now, this alarm will sound in all of the units through what is called the signal relays, providing, of course, that the signal system is working properly. We could demonstrate on our locomotives we have the alarm

system. If it would be permissible we could demonstrate the alarm system.

* * * *

[609] A. Show a ground relay (indicating).

Q. How long does the alarm ring? A. The alarm will continue to ring until the condition is corrected. And that could go on for hours and hours.

Q. At the time the alarm bell rings, does the engineer know which unit is affected? A. No, sir, he doesn't. Unless it is the unit that he is in, the indicating light lights up only in the unit that is affected. However, the bell, if the system is working properly, rings in all of the units, including the head unit. The engineer will know that he has some trouble, and he will be unable to tell what the trouble is until it is tracked down.

Q. I believe you said you are indicating ground relay action. What would have to be done to remedy this situation? A. Well, the ground relay is like a breaker switch on a house current. Any time there is a surge of power that will in any way go to ground, the ground relay immediately picks up and drops out the excitation circuit and returns the engine to idle position. (Demonstrating.) Now as you can see, we have turned off the alarm bell. The white light indicates that the ground relay has picked up. As you can see the power is all gone from the engine [610], also the throttle has been more or less disconnected, as we could put it, with the exception that if the locomotive was in number 5 or number 6 position. As you will see, the "D" solenoid is still lit up, which would intend to reduce the diesel engine below its idling revolutions per minute and, of course, it could not keep running, and the engine would die.

Q. What is the alternator failure, I believe, is another malfunction which will activate the alarm. Is that correct? A. That is right.

Q. Would you demonstrate that, please, sir? A. Well, as

you can see Mr. Clark has turned the switch for an alternating failure. There is a blue light that is showing, and there also the power has all been removed from the locomotive, and the power has been removed from the governor with the exception of the "D" solenoid, and the situation would be exactly the same—if the throttle position is number 5 or number 6 the engine would die because it has reduced it below its idling rpms. Now the alternator is like I pointed out in the drawing, the 170 volt AC current for the traction motor lowers and for the cooling fans. It energizes the relay that is called the no-voltage relay, which is set into the excitation circuit and, of course, when the no-voltage relay drops out, it breaks excitation [611] and removes the power from the locomotive.

Q. Now, when you have an alternator failure, the same alarm also sounds? The one that we heard. A. Yes, there is only one bell on the engine.

Q. What about the noise level of this bell as compared to the noise level of the alarm on a locomotive? A. Well, it all depends. They have placed the alarm system in a number of places on different locomotives. Some of our locomotives have approximately a six inch alarm bell mounted right in the cab. Of course, that is very noisy. Others——

Q. Noiser than this? A. Considerably more noisy than this. And others they have mounted the alarm bell inside of the cabinet, and in some of them they have also mounted it in the engine room on the bulk head of the cabinet. Of course, they can be readily heard, with the exception that they get pretty dirty in the engine room and, of course, the dirt, grease, and stuff that gets on them muffles the sound. And a lot of times if the bell hasn't been cleaned in a long time, you have an awful time hearing it. You might think you hear a bell ringing, and usually what we have to do then is open up one of the cabinet doors to find out for sure if we do have an alarm.

[612] Q. What is another malfunction or failure that will activate the alarm? A. Well, of course, the next most common one would be the low oil alarm. That is a condition set up—as you can see now that he turned the low oil alarm on, the yellow light is shining, and again all of the power has been removed from the locomotive, and also the power has been removed from the governor. Now the low oil alarm is a safeguard for the diesel engine itself. Any time that the lubricating oil pressure would drop below a pre-determined level then this low oil button kicks out, and when it does it removes all of the power and returns the engine to idle, with the exception that in the fifth and sixth throttle notch there again it would——

Q. What has to be done to remedy this situation? A. Well, unless the condition is because of an overheated engine which thins the viscosity of the oil to such an extent that it won't hold up to pressure, of course, as the engine sets for awhile the viscosity of the oil will thicken, and you can put it back on the line and it will hold until such time as it gets heated up again. After you get it back onto the line and working again, then, of course, you have to check your cooling fans and radiators and so forth to find out why you have the overheated condition. Many times [613] it is in connection with a hot engine.

Q. What is the fourth alarm? A. The fourth alarm that we have on there is for the boiler. Of course, that is only on passenger locomotives.

Q. Is there a hot engine alarm? A. Yeah. There is a hot engine alarm, there is a low oil alarm, and there is an alternator alarm. Also, there is a pneumatic control, PC switch alarm. Although many of the railroads do not use the PC pneumatic control anymore.

* * * *

Q. Mr. Wilkerson, I believe you told me there was one correction you wanted to make in your testimony thus far.

A. Yes, on the malfunction of the low oil alarm, when a low oil alarm comes on for any reason, it kills the engine regardless of what throttle position that it is in. I made the statement that it killed the engine if it was in the fifth or sixth.

Q. Speak up, if you will, Mr. Wilkerson. A. It kills the engine, regardless.

[614] Q. Will you show multiple operation of these two locomotives? A. Yes. We have demonstrated up to now just the operation of the one unit. Now, Mr. Clark will put in the controls for the individual units of the Alco, which is the green model, to the rear.

Q. What type locomotive is this? A. Alco, American Locomotive Company, the model DL 701. It is approximately the same capacity as the GP-9. The GP-9 is rated at 1750 horsepower, and the DL 701 is 1800 horsepower.

Q. Does the diesel engine in that model operate on the same principle as the diesel engine in the model you have described? A. No, the diesel engine is a four stroke cycle in the Alco. Outside of that, everything else is the same, all of the electrical hook-up and transition and so forth is all the same. The four stroke cycle, it has four complete strokes and makes a power impulse every other revolution on eight cylinders.

Q. All right, would you tell us about multiple unit operation now. A. Now, if Mr. Clark has got the Alco set up to be a trailing unit, then all he has to do is go to the controls on the head end, turn the isolation switch to on position. He has [615] already got it running. I was going to have him start from the head cab and show that it followed the same as the other one. Go through the transitions or do you want to take——

Q. No, the transition would be the same as you described earlier, would it not? A. Yes, it would be the same on both of them.

Q. Let's just start with the multiple operation then, of the two units. A. Well, for instance——

Q. Are they hooked up in multiple operation now? A. Yes.

Q. Which is the lead unit? A. The yellow one, the 1960.

Q. All right. A. And, of course, every time that you move the throttle position in the yellow one it will do the same thing on the green one, or any other unit that would be hooked together. As you can see by the light in the first cabinet on the green one that as he moves the throttle position the lights go on and off, which would indicate that that engine is increasing in rpms the same as the one on the controlling unit.

Q. The controls on the lead unit then will operate the trailing unit or units? [616] A. That is correct.

Q. All right. I believe we had one malfunction which sets off an alarm which we did not demonstrate this morning. What malfunction is that, or what alarm is that? A. We didn't show the hot engine alarm, which is excessive temperature on the cooling water. We can show the hot engine alarm on the Alco to show what happens in multiple unit operation. If you would show the hot engine alarm at this time (Demonstrates). Now, under the condition that is set up there, the Alco has excessive cooling temperature. We can show, as can be seen by the little light above the fan, when the light is on we indicate the fan is turning. Just before Mr. Clark moved the control you could see that the fan was off. Also, in other cases the shutters might not open. On the Alco we have our shutters so that they will open and close. Of course, with the shutters closed the air cannot, not enough air can be drawn through to cool the water in the radiators even though the fan would be running. This is a fairly common occurrence, and one that a fireman corrects.

Q. When this alarm occurs, does the engineer have any way of knowing what the alarm indicates if the malfunction is not on the lead locomotive? A. No, he doesn't. All that happens on the lead locomotive, like we showed

you, is the bell rings. The light indicating [617] in the cab of the unit that is affected, whether it be the second one, third one, or fourth one, however many units there is. And it is necessary for the fireman to go back and find out what unit is affected. Now, as I said before, hot engines are fairly common, especially in the summertime. The shutters might not open properly, the cooling fan might not be running. On the Alco the cooling fans are run by what they call an eddie current clutch, which is an electrically excited clutch, and the temperature control on the Alco merely increases the power of the clutch so there is less slippage, and the fan turns faster.

Q. Does the alarm continue to ring until the engine cools down? A. That is correct. Now, let's see, about the only other thing I suppose we should show changing operation, make the Alco the lead unit and operate in the other direction.

Q. All right, change ends. A. What has to be done at this time is that the master controls on the EMD have to be taken out, the individual unit controls are left in place, and then go to the Alco and the master controls are cut in on that, then the throttle, transition lever and reverser are operated, which will make the EMD the following unit, and the Alco will be the controlling unit.

[618] Q. Now, the engines are set up to move to the left as you face them? The Alco unit in the lead? A. That is correct. Looks like we had a wheel slip there. Now, there is a condition that happens frequently. As you can see there is no lights lit on the journal boxes of the EMD which would mean that——

Q. That is the yellow model? A. Yes—it would mean that the EMD is not producing power. Therefore, it is necessary for the fireman to go back onto the EMD and find out why.. As you can see from the lights on the throttle, the EMD is following the throttle all right, but it is not producing any power. On this one Mr. Clark

failed to move the reverser in the control cabinet, which if he will do now we can demonstrate how the interlocks.

Q. Is this the only instance of the reverser not following when the engineer does not move the reverser lever? A. No, this is just one that we are using. Power contactors will hang up, as I explained before, relays will not come in because of dirt or anything. Actually, it takes a very little bit of dirt on most of your interlocks, relays, so forth to stop them from passing current, which in turn stops them from producing power.

Q. Mr. Wilkerson, what type of malfunctions of the diesel electric locomotive occur without there being a corresponding [619] alarm and which the engineer could not locate the source of while the engines are stopped? A. Well, all of the excitation problems, as we term them.

Q. What are the excitation problems? A. Well, what we term excitation is anything that is producing the power. For instance, it could be in your battery field, it could be in the shunt field, be in any of the power contactors, anything that would prevent that trailing unit or units from producing power to the traction motors.

Q. Are there any similar types of malfunction? A. Yes. Again it can all be lumped into excitation pretty much. For instance, battery fields, shunt fields—Mr. Clark has just indicated that the battery field has dropped out. As you can see, the power has been dimmed to such a point that it almost looks like the lights are out. Under that condition the generator is producing roughly half of the power that it would produce if the battery fields were intact.—He has corrected the situation, and the lights are bright again. Also, as I explained, if the locomotive does not make transition it keeps falling off on the power it is delivering because of the back pressure, and we can show that. We have a reastat.

Q. Are all of these malfunctions to which you have just referred ascertainable only when the engines are under

power? [620] A. Yes. All of them that deal with, like I said, excitation, or producing of power, there is no alarm, and the only way that it can be found out is for the fireman to go back and find out which unit isn't producing the power.

Mr. Ross: Your Honor, at this time I would like to introduce pictures of these models and of this exhibit here rather than introducing the exhibits themselves, the models themselves. They are small pictures. If the Court desires we will be happy to have them enlarged.

Judge Van Oosterhout: Well, I think for the purpose here, we have seen the model.

* * * *

Mr. Ross: The picture of the flock board and the exhibit of the diesel engine and its component parts is marked Exhibit——

Mr. Ross: It will be IX-39.—Two pictures of the models marked IX-40 and IX-41. IX-40 is a side view from the Judge's bench.

Judge Henley: Both of them?

Mr. Ross: Both models, yes sir. IX-41 is taken at about a 45° angle of the front of the yellow model.

* * * *

[621] **Further Direct Examination,**

By Mr. Lessenberry:

Q. My question here doesn't relate to the operation that you described to the Court, but the motor unit as shown. You have identified the yellow unit as being the lead unit through much of your testimony. Is that correct? A. Yes, sir.

Q. I notice that the cab is more forward on that particular unit. Can you tell the Court, if you know, if the cab, this particular unit is always operated in the manner [622] that it is now, that is, forward? A. I think that

I failed to mention the fact that these units can be operated in either direction. Every locomotive has to have a letter "F" on the front of it to indicate the front. Now, as you can see, Mr. Clark has pointed to the "F" on the Alco, which is at the forward end of the long hood. A number of railroads operate with the long hood forward, or the engine forward, and therefore that would make that engine run forward, while most of the other railroads operate with the short hood forward, and there again we have indicated that the letter "F" on the front end. It makes considerable difference in the visibility, although from the engineer's seat it is approximately fourteen foot to the end of the nose, on the one with the short nose forward. And of course, on the longer one it runs about thirty-five feet.

Q. Sir, during the cross-examination of Mr. Pelton in response to a question, I believe, asked by Mr. Light reference was made to the steam locomotive system, occasionally or frequently, sometimes at least, smoke or debris might, from the steam locomotive might hinder either the fireman's or engineer's vision. Is there any debris or smoke association with the operation of this diesel electric power? A. Yes, a diesel electric can get to smoking every bit as bad as the steam engine, especially if it has leaking injectors, [623] you are producing an over-rich fuel condition, and the black smoke pours out. Also, you have heavy suction of air through your radiators and everything, and in the summertime especially dust and lint and leaves and everything tend to draw pretty bad. It can very seriously cut the view, especially where the long end or engine is running forward.

Q. I suspect—correct me if I am wrong—that the amount of this debris or smoke the engineer or fireman might occasion depends upon the prevailing wind or the direction of the locomotive and so forth? A. That is correct.

Q. Where is the exhaust on these locomotives? A. There are up on top. Mr. Clark is pointing out the exhaust on the Alco, and on the EMD there is two exhaust stacks.

* * * *

Cross-Examination,

By Mr. Light:

Q. Mr. Wilkerson, do you know why some railroads run with the long end forward? A. I guess it is just a railroad policy. When these locomotives were first developed, they were developed from the regular switch engine, was my understanding of it, and of course the regular switch engine operated with the engine forward. Also, I believe, on the Pennsylvania and New York Central [624] some of them, they figured that it was better to have the engine forward in case of collisions at crossings with automobiles and so forth.

Q. This affords protection to the enginemen having the long end forward in the event you hit something pretty big at a crossing, doesn't it? A. Yes, it does.

Q. Do you happen to know whether that very provision is contained in some of the collective bargaining agreements with the enginemen? A. I don't know. I imagine there would be.

Q. Mr. Wilkerson, is the knowledge of the operation of the diesel electric locomotive that you have manifested here today typical of the knowledge possessed by the other firemen you know? A. Well, yes, it is typical. The other firemen do the same work, they correct the same malfunctions, and while they might not be able to describe the relay in the proper terms, they know which one to push to get the power that they have got to have.

Q. How many of the firemen working on your railroad besides you and Mr. Clark do you know that took this correspondence course on the diesel locomotive? A. Let's

see, at the time that Mr. Clark took it, I think [625] that there was three others took the course. Like I said, I didn't take the course directly; I took it second-hand.

Q. How many of the operating firemen that you know would be able to build an apparatus like this exhibit you have been testifying to, and wire it? A. Well, I imagine if they got right down to it and had to figure it out the way that we did, they could do it. It gets pretty complicated. In fact, the wiring got so complicated on those that I was gracious enough to let Mr. Clark finish up the wiring and I went to the other details.

Q. What is the pre-employment requirement for firemen on your railroad? How do you qualify? A. Well, high school education, and then physical standards.

Q. You don't have to have any technical or mechanical or electrical background or training, do you? A. No.

Q. Why did you and Mr. Clark build this exhibit? A. Originally, we built it for an educational program that was going to be conducted through the Brotherhood of Locomotive Firemen and Enginemen. And then the models were used to go to Washington, D. C. to the Presidential Railroad Commission.

Q. Did you use the model before the Presidential Railroad Commission as you have here to explain essentially what [626] you have explained to the court? A. Yes, we did.

Q. Did you express the opinions to the Presidential Railroad Commission as you have here that a fireman is necessary in the operation of locomotives? A. Yes.

Q. Did you use this before the Arbitration Board 282? A. No, we didn't use the models before Arbitration Board 282.

Q. Did you testify there? A. Yes, I did.

Q. To the same general effect you have testified to here? A. Yes.

Q. There are number of lights and switches on these two exhibits. Have you had occasion to count them. Do

you know how many there are? A. Yes, we have counted them but I don't know whether I can remember right now. It seems to me that we have got over 24 switches. Is that correct, Kenny?

Judge Van Oosterhout: Mr. Clark can answer it if he can. He has been sworn.

Mr. Clark: There are over a hundred lights.

Mr. Light: How many switches, Mr. Clark.

Mr. Clark: There are approximately twenty-five switches. That is not counting the relays.

[627] Q. How many lights are normally located, signal lights like this, are normally located in the cab of the vehicle? A. It all depends on how the locomotive is equipped. Usually four.

Q. There are never going to be over five or six, are there? A. No.

Q. You did not intend to convey the impression with all these lights and switches the interior of the cab of a diesel locomotive had all that sort of apparatus to contend with, did you? A. No, I think I explained that what we were trying to do was show the circuits.

Q. I notice, Mr. Wilkerson, that you have both ends of each of these models the rails going to center posts, and I presume that indicates that if you had a whole locomotive instead of a half one that the rail would continue solid on across and continue on around. Is that correct? A. No, we are showing these units with the aprons, as you can see the little apron is folded down between the two—yes.

Q. Little walkways? A. Yes, sir, little walkways.

Q. On your railroad do they have those walkways on the locomotives which permits the employees to walk on the locomotives? [628] A. Very few anymore. They have been removing them the last few years.

Q. Have they likewise put solid bars across where there formerly was a break in the rails so that movement

could be had from one unit to another? A. Yes, they have.

Q. Was that policy adopted after you built this model? A. It was adopted about the same time. I think they started in in about 1959, as I recall. They bought their first GP-9s with the electric transition, and they were the first engines that didn't have the aprons.

Q. Haven't they taken the aprons off of some of the locomotives that were provided with aprons? A. Yes, in the past few years they have been taking aprons off of them.

Q. It would be a fair representation of how those locomotives would look in use, on your railroads at least, if you had left the aprons off and carried the rail on around the end, wouldn't it? A. Yes, it would.

Q. What is the practice on your railroad with regard to permitting personnel to pass from one unit to the other while the train is in motion? A. There is no rule against it, and the firemen do go back.

[629] Mr. Lessenberry: I think this witness has testified on what road, and I don't think it operates here in Arkansas. I object to his testimony about the practices there unless it does relate to the practice in Arkansas. I object to it as being immaterial.

Judge Van Oosterhout: The ruling is reserved. You may answer the question.

Q. Go ahead. A. How did you word that?

Q. I wonder what the practice was on your railroad with regard to whether the employees are permitted to move, and do in fact move from one diesel unit to the other while the train is in motion? A. Yes, they do move from one unit to the other, and the way they do is merely step across, it is not a very great distance.

Q. How do they get over the rail? A. Mr. Clark can demonstrate.

Mr. Clark: Between the rounds, and step over here and here (indicating), or come down on the step, and

step onto this step, apron here and over to this apron.

Q. I understood you to testify that you had been regularly working as an engineer for several years. A. Yes, since 1961.

[630] Q. What is your present assignment as an engineer? What runs are you making? A. I am in what we call the chain gang service, freight service, between Mile City, Montana, and Marmarth, North Dakota.

Q. Is this through freight service? A. Yes.

Q. What size crew do you have on those trains? A. We have a five-man crew.

Q. Have you consistently had a fireman in the past year on these runs you have made? A. Yes, we operate with firemen almost consistently due to the fact that they pulled off the passenger trains and other jobs just before Award 282 went into effect. In fact, we still have men on the reserve list.

Q. That gave you an excessive number of protected men that had to be worked as firemen, is that right? A. That is correct.

Q. Have you since the Award worked as an engineer on a locomotive without a fireman? A. I have twice is all.

Q. Was it this run that you have just described? A. Yes.

Q. And so that would be a total crew of four men? A. That is correct.

[631] Q. Did you all get between terminals all right? A. Yes, sir.

Q. Nobody injured on that trip? A. No, there wasn't.

Q. Didn't injure any members of the public? A. No. In fact, we go thirty-five miles at one stretch without ever crossing a crossing. It is a very sparsely populated area where I live.

Q. In view of that circumstance, you think you could get along pretty well without firemen up there?

Mr. Youngdahl: I object. He has not qualified as an expert in that area.

Mr. Lessenberry: To make his answer admissible in this suit he would have to qualify, he would have to establish that his road operated like the roads in Arkansas, terrain, or any of the other many differences that might occur.

Judge Henley: This brings up a more basic problem that I have with this witness' testimony and Mr. Light's cross-examination. At the outset, or near the outset of Mr. Light's cross-examination I thought I understood him to ask this witness the question which assumed that the witness on his direct examination had given an opinion that it was necessary to have a fireman. I may have missed something or gone to sleep right before lunch, but I did [632] not recall that this witness ever testified as to any opinion as to whether or not a fireman was necessary. If the witness has not given such an opinion, Mr. Light, do you care to continue asking him about his opinion?

Mr. Light: No, Your Honor, I am prompted by the Court's observations to agree with the Court's recollection of the evidence. I don't believe that he has testified to that effect.

Judge Henley: I didn't think he did.

* * * *

Redirect Examination,

By Mr. Lessenberry:

Q. In regard to Mr. Light asking you about the number of switches and so forth on your model that has been displayed here as opposed to the engines that are actually in use on the road, I think you said that there were so many switches and so many lights. In fact, on a regular locomotive didn't you say four or so lights? A. Four alarm lights.

Q. In regard to the circuits that have been displayed through the use of this model, are those same circuits actually [633] in use and in effect on one of these diesel electric locomotives? A. Yes, sir.

* * * *

[634] **MR. WINFIELD M. HOMER,**

being called to the witness stand on the part of the Intervenor, after being duly sworn, testifies as follows:

Direct Examination,

By Mr. Youngdahl:

Q. Would you state your name, please. A. My name is Winfield M. Homer.

Q. Where do you live, Mr. Homer? A. I live in Washington, D. C.

Q. By whom are you employed? A. I am associated with the Labor Bureau of the Middle West.

Q. What is your title or position with the Labor Bureau of the Middle West? A. I am presently a partner in that organization. I am a consulting economist and labor relations adviser.

Q. What is the function of the Labor Bureau of the Middle West? A. The Labor Bureau of the Middle West is an association of professional men to provide technical, statistical and economic assistance to employee organizations, and primarily labor organization functioning in the field of public utilities and transportation. It has been in existence some forty odd years, since the early 1920's. We presently have offices in Chicago and in Washington.

Q. For how long a period of time have you been associated [635] with and/or employed by the Labor Bureau of the Middle West? A. I was employed by the Labor Bureau in October, 1944. I became a partner in the organization in 1960.

Q. Will you please tell the Court your educational and vocational experience prior to that time? A. I attended school in St. Louis, Missouri. I graduated from Washington University in that city in 1934. The degree in Business and Public Administration. In 1936 I was employed in the International headquarters of the Order of Railroad

Telegraphers located in St. Louis. That organization is one of the standard railway labor organizations, one of those representing the non-operating railway employees. My duties with the telegraphers organization as research director involved the making of factual studies concerning the problems of the employees represented by that organization, advising the leadership of the organization on policy in the light of such factual studies, participating with the leadership and the members in collective bargaining, in mediation, and in other such proceedings. Appearing as a witness before Boards of Arbitration, Presidential Emergency Boards, considering all types of problems involving employees represented by that organization.

Q. Mr. Homer, directing your specific attention to the area of railroad safety, have you had experience in connection [636] with analysis and evaluation of railroad safety matters or any other experience in railroad safety matters? A. Well, of course, to begin with, railroading being the kind of field that it is, any form of collective bargaining activity eventually will require examination of the safety facets of railroad. And throughout my career, first with the telegraphers organization, and after that when I worked with all of the organization during my career with the Labor Bureau I have been faced with the necessity of examining the safety records of railroad employees involving first the personal hazards to such employees and the degree to which their work and responsibilities for the avoidance of accidents was a part of their job content. This entailed, of course, the submission of statistical and economic materials, and, of course, safety materials to many Arbitration Boards, and more particularly boards established by the President of the United States in investigating disputes that gave rise to emergencies under the Railway Labor Act. In 1961 I submitted very extensive material in the safety area to

the Presidential Railroad Commission. The Interstate Commerce Commission during the last year and a half has been reviewing the locomotive inspection rules, and I was asked to appear and testify in that connection regarding the safety of operations, particularly of locomotives. [637] A few years ago the Interstate Commerce Commission had an inquiry into the safety of a new freight car with extended draw-bar. All of the questions of safety of operation of that device was submitted, and I appeared again at the request of some of the railroad employee groups to submit safety information to the ICC. The year 1960 Congress revised the Accident Reports Act. The Accident Reports Act was originally enacted in 1910. In 1960 some revisions were made in that Act which necessitated a thorough revision, examination of the rules by which accidents were reported to the Interstate Commerce Commission. The ICC invited the railway labor group and the railroads to participate in a tripartite conference wherein they would make such revisions as were needed in those rules. I was a member of the committee selected by the railway labor group to participate in those conferences, and the accident rules which I believe were submitted in one of the exhibits by Mr. Greer, Exhibit 109, the appendix of that, is the principal product I should say of those conferences.

Q. Mr. Homer, as a result of your experience and in particular your study of the railroad accident experience from May 1964 until date, do you have any opinions as to any particular trends that have developed in that time?

Mr. Lucente: I object to the question on the ground that he doesn't specify what kind of trends he is talking [638] about, asking the witness to comment. The witness' experience also is confined to a limited area. If he has asked for trends in that area, well and good. But he should specify.

Judge Van Oosterhout: This is a kind of preliminary

question, just answer yes or no, and perhaps Mr. Youngdahl will direct further examination to disclose the field in which he is trying to seek information.

Q. Do you answer yes or no to that last question? A. Yes.

Q. Do you have an opinion with particular respect to trends in railroad safety from May, 1964 up until now? A. I have examined the statistics quoted by the Interstate Commerce Commission which reflect safety experiences of the railroad since that time.

Q. What is your opinion about the principal trends in railroad safety from May, 1964 up until now? A. The fact is, Mr. Youngdahl, that immediately following the effectuation of Arbitration Award 282 in May, 1964, there was a sharp increase in train accidents, and collisions in particular, and that trend has continued since that time.

Q. Have you prepared a series of documents which relate to the trends in railroad safety since May, 1964, and to other trends involving railroad safety at other times? [639] A. I have.

* * * *

Q. I call your attention to what I have marked Intervenors' Exhibit 42, some Interstate Commerce forms. Particularly as to the first page, the envelope with the booklet on the inside of this exhibit, Mr. Homer. Is this booklet in that envelope related in any way to the committee or the group in which you participated which made a study of railroad accident reporting? A. Yes, this is the set of rules which resulted from that joint or tripartite consideration of the rules.

[640] Q. How many sessions or over what period of time was that study or the portion of study in which you participated, how long did it take? A. The work began in the summer of 1960 and occupied the late summer months and early fall months of that year. I don't have an exact day by day record of all of the occasions on which the meetings took place.

Q. Would you please turn to the second page, Mr. Homer, of Intervenors' Exhibit 42, a form which appears to be called a Form T and tell us please about the function of that form. A. Form T is the initial report made on any accidents—train, train service or non-train accidents—by the reporting carrier. A form of this kind is filed with respect to each accident that occurs.

Q. I notice the form says monthly report. Does that indicate anything about when the form is to be filed in relation to the accident? A. Yes. The T forms are filed at the end of each month following the occurrence of the accidents. You will note that the form calls for the name of the carrier, the general information as to where the accident occurred, the date, of course, of the accident, identifies the kind of accident, a considerable amount of information is requested as to visibility and weather conditions, whether it was daylight, whether it was dark, foggy, snowing; information is also [641] requested on the amount of the damage done, as well as it can be estimated, at the time of the accident.

Q. Have you examined forms of this kind submitted by the railroad from time to time? A. Very many.

Q. By railroads—plural, I should say—from time to time? In general, are most of the items on this document filled out or only some of them or all of them, or what is the situation usually? A. Most of the items that are pertinent are filled out. I should say all of the items must be filled out if they are pertinent. For example, on a train accident virtually all of the items as to visibility, weather, damage in dollars and so forth are expected to be filled out. Of course, in a train service accident, which may involve only a personal casualty, some of the information, damage to equipment, for example, is not needed. For non-train accidents, very little of this kind of information is requested.

Q. Let's see, to refresh my recollection, train accidents,

train service accidents and non-train accidents are the three big causes? A. Those are the three major categories.

Q. And a train accident requires how much damage in dollars? [642] A. The present property damage standard is $750.

Q. Whether or not there is a casualty. Is that right? A. Whether or not there is a casualty, and that limitation applies only to the value of the equipment and the value of the roadbed and track. And equipment as referred to would mean only railroad rolling stock, it would not refer to, let's say, a value of a truck, whoever owns the truck, bus or any vehicle that is hit. It is only the railroad property.

Q. How about a derailment, for example, that causes damage to a structure owned by the railroad at the side of the track. Would that be included? A. That would be included.

Q. About how many Form T's are filed in the course of an average year, the last two or three year period, Mr. Homer? A. I would say in the twenty thousands, twenty-five thousand, roughly in that neighborhood.

Q. Do Form T's ever to your knowledge show the composition of the operating crew, that is, what classification of employees were on the train at the time of the accident? A. There is no question on the Form T, Mr. Youngdahl, asking for that information. I have observed on some railroads—one railroad in particular—after the effect of Arbitration [643] Award 282, the Louisville & Nashville Railroad for at least some part of the period indicated whether or not a fireman was present on the locomotive.

Q. As far as you know do railroads maintain records themselves of any kind, or any railroad, as far as you know, indicate the composition of the crew at the time of an accident? A. The railroad, of course, for its payroll purposes keeps a record of every trip of every tour of

duty and the personnel made up of the crew at that time. That is needed, of course, for payroll records.

Q. Continuing to the next sheet in Intervenors' Exhibit 42. What is this form, Mr. Homer? Called Monthly Report Accident at Highway Grade Crossings. A. In addition to the Form T, whenever a rail-highway grade crossing accident occurs, the Interstate Commerce Commission requires this supplementary report form being filed. This, you will notice, gives information not only about the train, also detailed information on the kind of vehicles that may also have been involved in the accident. It tells also of the nature of the crossing protection. It goes into the visibility question of whether the track was obscured by various factors—topography, a passing train, vegetation and other elements. You will note the footnote at the bottom indicated by the asterisk that special information is requested as to whether dangerous commodities were [644] carried.

Q. Now, when it says dangerous commodities, referring to liquid petroleum and so forth and radioactive materials, is that dangerous commodity on the vehicle which is hit or on the train, or both? A. The question relates to the vehicle itself.

Q. Referring then to the last page in IX-42, Form V. What is that form, Mr. Homer? A. Form V is the summary report which accompanies the T Forms when they are sent into the Interstate Commerce Commission at the end of each month. It sums up in very simple form the number of train accidents in all that occurred during the month, the train service accidents, and so forth, and gives a quick summary to the Commission of the accidents which occurred during the month. It also shows, you will note toward the top of the page, the number of locomotive train miles, motor train miles, and yard switching miles. This information is collected for every kind of railroad, Class 1, Class 2, in every month of operation. I think I

should say at the same time, the ICC does not collect—that is, the Bureau of Safety and Service, does not collect employment information. Such information is collected by another bureau of the ICC.

Q. The Bureau of Railroad Safety and Service is the bureau that collects the T form and the supplement V form to which we have just been referring. Is that correct? A. Yes.

Q. The total number of miles run, does that mean miles run on trips that involve accidents or all miles run? A. The total miles run will include all miles run during the month, Mr. Youngdahl.

Q. I think, Mr. Homer, it might also be helpful while we are talking about forms, if you would explain to us—we have had reference to M-400, M-300, and other kinds of reports or forms employed by the Interstate Commerce Commission. What, for example, is the M-400? A. The M-400 is the monthly summary of accident statistics published by the Interstate Commerce Commission, based, of course, on the T forms which it collects. The Interstate Commerce Commission also brings out a preliminary form which it identifies as the M-450. The M-450 is preliminary information, and is based wholly on the summary information that is on Form V. M-300 is the monthly report of employment, compensation and hours of service, which is collected by the Bureau of Accounts of the Interstate Commerce Commission at this time.

Q. Are there other Interstate Commerce Commission reports [646] or forms which have been referred to in the data that you have prepared that you maybe could identify it for us now in a preliminary way? A. Most particularly the Annual Accident Bulletin. At the end of each year the Interstate Commerce Commission reviews in depth all of the T Forms and statistics that have been collected through the T Forms and related information and compiles them in a very comprehensive bulletin that runs, I

believe, more than a hundred pages, with many tables, analyzing accident experience, accident causes from many, many different facets.

Q. Mr. Homer, are you familiar with the term "exposure" as that term is used in evaluating railway safety? A. Yes, I am.

Q. What is the meaning of exposure, and what is its significance in such kinds of evaluation? A. In revealing accident experience we must examine both accidents and casualties, with reference to some measure of the exposure, expressing the potential or possibility of accidents. I think a very simple concept, ten men exposed for a given amount of time have ten times the possible exposure of one man exposed under the same circumstances for that same amount of time. And one man working forty hours has five times the exposure of one man working eight hours. It is as simple as that. [647] Now the T concept, and this is the term exposure, it is the opportunity or potential of that entity, whether it be a train or an individual person, that is subject to the hazard. Now casualty rates, to be meaningful, are universally based on the exposure of the individual subject of the casualty, wherever it is possible to make that relationship. A standard was set forth definitively by the American Standards Association, which is a general association of industrial engineers, government statisticians and other individuals, relating to many problems, not just safety, but many problems that require measurements that arise in American industry generally. Among the things that they have examined has been appropriate standards for measuring the safety of industrial establishments. They have adopted as the universal standard in measuring employee casualty, the casualty rate based on the million man hours worked. Now the Bureau of Labor Statistics, and the National Safety Council, both have adopted the same standard. The Interstate Commerce Commission uses this standard; the As-

sociation of American Railroads use this standard; the railroad unions and the railroad carriers themselves in most proceedings have used this standard.

Q. Have you, Mr. Homer, at my request prepared a chart or table which reveals some contrasts between various exposure [648] factors, particularly gross ton miles, locomotive and motor train miles, and total employment? A. I have.

Q. I now hand the Clerk Intervenors' Exhibit 43. And ask you Mr. Homer, if you would please describe that document for us. A. This is a simple tabulation that relates to the trend of locomotive and motor train miles, gross ton miles and the total employment of Class 1 haul railways. The locomotive and motor train miles were taken from the M-400 statement published by the Bureau of Safety and Service. The other figures are also ICC figures, but they cover only Class 1 railroads.

Q. What does Intervenors' Exhibit 43 show, Mr. Homer, insofar as measuring casualty rates under those three different exposure factors? A. The exhibit shows the divergence in trend between the locomotive and motor train miles, the gross ton miles, and employment. Throughout this period there has been a steady decline in employment, from 718,000 employees in 1961, to 640,000 in 1965.

This decline in employment, of course, had the effect of reducing the number of employees throughout the industry who were exposed to casualties, to hazards. At the same time this was occurring, [649] however, the locomotive and motor train miles which express the increase over a period of years of train operations, locomotive operations in yard service are included. Locomotive and motor train miles have been increasing. You notice that they increased by roughly five per cent over this same period when employment was declining. Gross ton miles, which measure in this case the total weight of the train, the weight of the locomotive, the weight of the cars and

contents. In other words, the weight of the freight and the passengers. Gross ton miles increased some eighteen per cent during this period. Now it is appropriate to use locomotive and motor train miles as a measure of exposure of trains, of train accidents—collisions, derailments, whatever the accidents may be, because that is the index of the extent to which such trains are exposed. And I insist the word "exposure" is very important to hazards. I don't know exactly what gross ton miles measure the exposure of. Perhaps just the composites of the weight of the trains, whatever significance that may have.

Q. Did you at my request examine Plaintiffs' Exhibit 114 which dealt with the reliability of using man hours as an exposure factor? A. Yes, I did.

Q. What are your observations about such exhibit, if any, Mr. Homer? [650] A. Well, a few preliminary observations, Mr. Youngdahl, when I get to some of my later statistics I may refer back to this particular tabulation. First of all I would like to recall what I think Mr. Greer, in his testimony, postulated as the difference in the effect of using motor train miles and using man hours as the exposure factor. He compared the results of taking a train which had in the first period five men aboard, and in the second period three men aboard, and assuming no change in casualty, you would have by virtue of that decline in the number of employees an apparent increase in the casualty rates. I would like to suggest what happens when you use locomotive and motor train miles as the exposure index in those same circumstances.

Q. Just talking about casualties now, and not train accidents. A. Casualties, exactly. Assume that you have a train operate one mile, and in that one mile there is an accident which kills all five people, or injures all five people aboard, assuming a number of employees of five. You will there have in terms of the casualty rate for locomotive miles five casualties per mile. If you reduce that crew to

three employees, then you have the same kind of an accident that kills or injures all three, you will have a drop in the casualty rate from five to three. Now had you used the man hours of the employees in this case, you would [651] have, measuring of course the persons who are on these trains, you would have no change whatever in the casualty rates between those two periods. No change whatever. Now referring to Mr. Greer's Exhibit 114, there are three central facts in this exhibit which indicate the change, suggest the change in the casualties and the casualty rates. Now the first of those facts relates to the decline in passenger service and the attendant decline in the number of casualties resulting from passenger service. The first occupation, you will notice, is passenger conductors. Now the number of casualties that occurred for passenger conductors dropped from 100 to 84 from 1963 to 1965. Some of the other passenger occupations—passenger baggagemen—dropped from 77 to 41; passenger engineers dropped from 83 to 66. Now this was a consequence very substantially of the fact that there was a substantial decline in passenger service during that period. Another element that saw the casualties decline was in the removal of firemen. Look at the last three occupations, 126, 127 and 128. Note that there was a decline for yard firemen from 212 to 91 decline in the number of firemen suffering casualties. Now that is the second of the factors that affect the trend of casualties for this group of employees. Now [652] the third one is the one that Mr. Greer mentioned, what he referred to as the change in the composition of the work force. Now that is a factor. Any statistician looking at figures of this kind knows that a change in the mix of employees can have an affect in changing the trend one way or another. Mr. Greer's method of correcting for that in the box on the bottom of the second page of his table actually did this. It took the reduction in accidents for passenger service employees, the reduction in the acci-

dents for firemen, but in computing the accident rate he used the man hours based on 1963 before there was any such reduction. That had a larger affect in the overall result that he achieves on this than any of the change in mix that he emphasized. I would like to call attention to a much simpler test that the Court might make in judging the contention that Mr. Greer has made here. On page 2 of the exhibit he has shown the casualty rates for the individual classes—columns 4, 5 and 6. Now, if we confine our attention to the freight and yard service classes where they were not affected by the removal of firemen, and not affected by the decline in passenger service—I am saying affected and statistical affects in term of mixed—there were nine such occupations—113, 114, 117, 118, 119, 120, 122, 123 and 124. Now seven [653] of those nine classes, individually taken, no affect in the change basis had increases, not only in the casualties but in the casualty rates.

Q. Now let's see if I understand that. If you select the classification off of Plaintiffs' Exhibit 114 in which the effect of the employment mix could not have any effect on the casualty rate you would find substantial reductions, substantial increases in casualty during the period in question? A. You will find increases, in some cases substantial and some cases not so great. But in seven of the nine occupations taken individually there are increases.

Q. Now let's proceed from our general statistical discussion to the specific period of May 1964 up until now. First of all, does the Interstate Commerce Commission issue an annual report? A. Yes, each year it sends to Congress its annual report of its stewardship during the preceding fiscal year.

Q. How many annual reports, or how many fiscal years since May, 1964, have been covered by annual published reports? A. Thus far, two.

Q. At this time I hand the Clerk Intervenors' Exhibit

44, a document entitled Excerpts from the Seventy-ninth Annual Report of the Interstate Commerce Commission for the fiscal year ended June 30, 1965, and Intervenors' [654] Exhibit 45, a document entitled Excerpts from Eightieth Annual Report of the Interstate Commerce Commission for the fiscal year ending June 30, 1966.

* * * *

[656] Q. You were discussing Exhibits 44 and 45, excerpts from the two annual reports of the ICC issued since May, 1964. Why did you extract these particular excerpts from these two annual reports? A. These are the findings of the Interstate Commerce Commission relating to railroad safety.

Q. Are there any portions of these, taking them one at a time, are there any portions of the Intervenors' Exhibit 44 which is of special relationship to the accident rate matter and the crew consist matter since May, 1964? A. I think all of the comments of the Commission relating to the safety experience of the railroads do peripherally relate to this period in which the crew consist change has become effective. I would only call attention of the Court specifically to the material starting on the bottom of page 4 where the Commission expresses alarm at the increase in fatalities, the comment at the top of page 5 where they comment on increase in train accidents, [657] and in the third paragraph on that page their comment with reference to the violations of safety laws by the railroads, on the top of page 6 their comments on the increase in the number of locomotives found to be in unsafe condition, then their comments on the growing menace of highway grade crossing accidents, which is about halfway down page 6, and then the rather extensive comments on pages 6 and 7 on the transportation of dangerous hazardous commodities, explosives and radioactive materials.

Judge Henley: May I interrupt. Mr. Homer, back to page 4, in commenting upon the increase in fatalities for

1964, is the Commission talking about fiscal 1964 or calendar 1964?

A. In this case they are talking about calendar 1964.

Judge Henley: Calender 1964?

A. Yes.

Q. These page numbers to which you are now referring, they are the numbers of the pages in the exhibit as distinguished from the numbers of the pages in the annual report. Isn't that correct? A. Yes, the original pages of the annual report have also, of course, been reproduced, since these are just photostatic xerox copies of the original.

Q. Would you briefly indicate as to Intervenors' Exhibit 45, the [658] subsequent annual report, which portions particularly relate to issues in this case, to your view? A. I point in particular to the Commission's first comment on page 3 on the alarming upward trend of train accidents. They note that since 1961 the number of train accidents has increased 43.8%. They then in the next section call attention to the number of violations of railroad safety laws, which in this latest period covered, rose 29.8%. On page 4 they make a special comment on the large number of unsatisfactory maintenance conditions in the signal systems of the railways. And then on page 6 they again go into very great detail in connection with the transportation of explosives and other dangerous articles, referring to it as an expanding problem that has been given top priority by the Commission's administrative and budgetary decisions.

Q. Did you, Mr. Homer—I see there are pages 9, 10, 11 and 12 are tables. Are those tables that appear in the annual report itself? A. Yes, they are, Mr. Youngdahl.

Q. I note that on the other hand, in Intervenors' Exhibit 44 you did not append tables. Was there any reason for that? A. These tables are duplicated each year. The years 1962 through 1965 are all covered in the latest re-

port. I felt it unnecessary to show a similar table in the preceding.

[659] Q. I now hand to the Clerk Intervenors' Exhibit 46, which is the Fifty-fourth Annual report of the Section of Locomotive Inspection of the Interstate Commerce Commission, Intervenors' Exhibit 47 which is a report of the Section of Railroad Safety, Bureau of Railroad Safety and Service of the ICC, and Intervenors' Exhibit 48 which is Selected Statistics from the two preceding reports. I think it is established, Mr. Homer, that the Interstate Commerce Commission has several different bureaus which perform various functions of the functions assigned to commission by law, and I think I will be permitted to say that the first two reports are the reports which are indicated on their face, and do I understand that Intervenors' Exhibit 48 is a selection of certain figures from those two reports. Is that correct? A. From those reports and from similar reports of earlier years.

Q. There is material in 48 which is in addition to the material found in 46 and 47? A. Yes, because we have gone back in 48 to take comparable statistics from the same type of public reports for many earlier years.

Q. Now, as to the selection in Intervenors' Exhibit 48, what were the standards which you used to select those statistics, Mr. Homer? [660] A. These figures were figures that reflected on such elements as the safety conditions of locomotives and the safety appliances on freight cars, both with reference to all U. S. railroads and the railroads in Arkansas.

Q. Let's start on page 1 of Intervenors' Exhibit 48—let me ask you first, why did you select the two periods 1931 to 1940 as contrasted with 1955 to 1965? A. Well I chose to get a period of years which would reflect in general the condition of steam locomotives in the period prior to World War II vis-a-vis the condition of diesel locomotives in the period since 1955.

Q. Just briefly, Mr. Homer, what was the condition during World War II—I think it has been referred to several times—but what was the condition in World War II, during that period which was abnormal? A. Well, of course, the traffic necessities of World War II, emergency conditions, caused the railroads to bring back into operation every possible unit of motive power and car equipment that was usable. At the same time, because of the unprecedented expansion in operations during that period, they utilized their equipment much greater, and they were unable, at the same time, to expand their maintenance forces. The result of that was that the emergency conditions caused a tremendous deterioration in the condition of both [661] locomotives and car equipment.

Q. What then do the contrasts to the two periods and the developments in the two periods shown on page 1 of this exhibit show? A. On page 1 they show that looking first at all U. S. railroads and looking at the condition of freight cars in the 1930's with defective safety appliances, I think it is quite clear that the proportion of freight cars in the later period beginning in 1955 is quite generally worse. A larger proportion of freight cars had defective safety appliances than in the earlier period. Now that same fact generally is true of the railroads which operate in Arkansas.

Q. Do the statistics on this page reveal any difference in substance between the railroads that operate in Arkansas and the railroads that operate in other states? A. I would think not. There is a variation from year to year, but overall looking at it statistically the condition of the Arkansas railroads was perhaps a little worse during the earlier period than the average for the country as a whole, perhaps slightly worse in the latest period, but there is great variation.

Q. Incidentially, what are safety appliances, as the term is used in this chart? A. Safety appliances are defined

actually in the safety [662] appliance laws. They are defined by statute. I don't know that I can recall them all, but they will include the brakes and the various appurtenances that operate the brakes, the couplers and the various devices relating thereto, and most of the parts of freight cars and locomotives that service the employees access to them, the steps, the ladders, the grab-irons and so on. Elements of that kind.

Q. The law to which you refer, is that the Federal Safety Appliance Act? A. They call it the Acts, however, it is plural.

Q. Are there other acts which the Interstate Commerce Commission administers in reference to railroad safety besides the Safety Appliance Acts? A. Yes, there are a number of such acts. Of course, the Safety Appliance Acts themselves include the original acts and such amendments as were adopted in later years regulating, changing the regulations on air brakes, adding the regulations of signal systems, for example. There are the locomotive inspection acts, there are the accident report acts, and there are some miscellaneous acts that have been adopted through the years relating to locomotive boilers, for example, in the old steam locomotive that have become out of date.

Q. In addition to those acts which cover specific aspects of [663] railroading about which you have just told us, is the Interstate Commerce Commission given or does it exercise any kind of plenary power over railroad safety? A. It does not.

Judge Van Oosterhout: I think Mr. Lucente has something.

Mr. Lucente: I object. I don't recall that Mr. Homer's qualifications included any law degree or any ability to interpret legislation pursuant to which Interstate Commerce Commission functions. I object on that basis.

Mr. Youngdahl: I will withdraw the question and rephrase it, if I may.

Q. Are you aware of any expression by an official of the Interstate Commerce Commission concerning its inability to function with plenary power over railroad safety as distinguished from authority under certain specific acts?

Mr. Lucente: I object to that on the grounds that it is hearsay, Your Honor.

Judge Van Oosterhout: The ruling is reserved.

Q. Are you so aware? A. Yes, I am aware of such.

Q. What statement in that area are you aware of? A. The acting chairman of the Interstate Commerce Commission [664] appearing before the Senate Commerce Committee in connection with the Public Law 88108 made a statement as to the extent of the Commission's power to regulate railroad safety.

Q. Returning to Intervenors' Exhibit 48, going to page 2, what does page 2 reveal? What do the statistics on that page reveal, Mr. Homer? A. On page 2——

Judge Henley: Mr. Youngdahl, before you leave page 1 I would like to ask one question that might possibly be objectionable from Mr. Lucente's standpoint, but I am going to ask it anyway. Mr. Homer, do you know of any changes in the safety appliance requirements in the period 1955 to 1965 as opposed to those requirements during the period 1931 to 1940? Are the figures on page 1 directed to the same kind and numbers of appliances?

A. There were modifications, I believe, particularly in the power brake acts, in the 1950's, that would affect these figures to some extent. I have never seen any detailed analysis as to what that affect would be.

Judge Henley: What I am trying to find out is whether the exposure is the same?

A. There may be a difference.

Mr. Youngdahl: Mr. Lucente did not object, Your Honor.

Q. Turning now to page 2, Mr. Homer. I think I asked you what [665] the figures on that page revealed. A. On

the preceding page we showed the composite by years of all the Class 1 railroads with mileage in Arkansas. We show the figures for the latest year for each of the individual railroads in Arkansas on page 2. There is some variation, vary from the 10.4% of the Louisiana & Arkansas to 5.5% for the Cotton Belt Railway. All in all though the average rate of 6.9, is very close to the average of all United States railroads.

Q. The inclusion of the Louisiana & Arkansas Railway Company not at least formally a plaintiff in this action, why did you include that railroad here? A. Well, it is one of the Class 1 railroads which operates here.

Q. I see. Do you know if it has any affiliation with any of the railroads in Arkansas? A. Yes, it is controlled by the Kansas City Southern Railway.

Q. Now, when you say freight cars inspected on this, does that cover freight cars including those that the railroad has already found defective and taken out of service? What point are they inspected? A. The freight cars are inspected when they are ready for use. That is also true of locomotive inspections.

Q. And locomotive inspections is what is dealt with on the next page. Is that correct? [666] A. That is correct.

Q. What does the material on page 3 reveal, Mr. Homer? A. The material on page 3 deal with the similar facts for locomotives. Now the ICC's authority with reference to locomotives is more complete than it is with respect to freight cars. They have a regular inspection of locomotives for all parts and appurtenances, not just those parts which are classified as safety appliances. The figures at the top of the page deal with steam locomotives, those which were in operation during the 1930's, and the latter part of the table, the diesel locomotives. The figures are for all locomotives, but they are predominantly diesel locomotives, in the later period. Looking at the percentages there is not a great deal of difference between the per-

centages of defective locomotives in the steam era from those in the current era. There is a variation from year to year. This fact is true for the Arkansas railroads as it is for all railroads in the United States.

Q. Now, let's take a look at the exposure factor here. As to the period 1955 to 1965, all locomotives, does that include any steam locomotives? A. 1955 to 1965 would include perhaps a few, but very few.

Q. During that period of 1955 to 1965, are you aware of any changes in the standards of inspection, any changes in the [667] standards of inspection employed by the ICC as to locomotives? A. No, I am aware of no such change. As I think I stated earlier, I think there is under consideration by the Interstate Commerce Commission now a request by the railroads to revise those standards.

Q. Turning to page 4, locomotive defects revealed on page 4, does your comment about the time of inspection also apply there? A. Yes, it does.

Q. And what does the data on page 4 reveal, Mr. Homer? A. On page 4 we show in addition to the relationship between the number of locomotives inspected and the number found defective, as shown on the preceding page, the number of defects found. We noted that a number of years the number of defects was very substantial per locomotive. It is also in the column on the extreme right we show the number of locomotives which are ordered out of service. Now, these are again locomotives which are available for use. They are not in the railroad shops, and in some instances these figures show the ICC as inspecting the locomotives, order them out of service.

Q. In all instances is this prior to any decision by the railroad itself to take the locomotive out of service? A. Yes.

[668] Q. Are there some defects that are found which are not of a nature requiring the locomotive be ordered out of service? A. Oh, yes.

Q. So the total in the last column is not, is less than the total represented by the percentages in earlier columns? A. It is always substantially less, of course.

Q. Now on page 5, is that the same data as applied to the railroads in Arkansas? A. Yes, it is.

Q. Is there any significant data to which you wish to call our attention on page 5? A. I believe the figures speak very much for themselves. Again, these are locomotives ready for operation, and in Arkansas as in the country as a whole, the Interstate Commerce Commission has found many defective locomotives and has ordered a considerable number of them out of service.

Q. Does there appear to be any trend in the period reflected on page 5 as to the percentage of locomotives ordered out of service on railroads operating in Arkansas? A. I would think not. If you review, you will find that there are 82 in 1956, and it dropped to 52 in 1957, and that there was that kind of variation in the years which followed. I see no real measurable trend.

[669] Q. I now hand the Clerk Intervenors' Exhibit 49, entitled Railroad Accident Experience, 1930 to 1956. What, in general, does the material in this document, Intervenors' Exhibit 49, reflect, Mr. Homer? A. This exhibit brings in the pertinent long-term accident statistics of the railways covering the period from 1930 through 1956.

Q. Why did you select that period? A. Well, I did not select it. First of all, I think it is already clear in the record here that beginning in 1957 the figures are not in any way comparable with the earlier figures. The selection of these periods was actually made by the Interstate Commerce Commission. In the excerpts on page 3 which was taken from the 1950 Bulletin, the Interstate Commerce Commission made the following comment in their Accident Bulletin. Perhaps I should read it. "There are several tables in part I of this issue of the Accident Bulletin which show, in addition to yearly totals, similar information for

an average year in a period of industrial depression (1930-34), a prewar period of normal conditions (1935-39), a period which includes some wartime years (1940-44), and a postwar period (1946-50).". Now this statement appeared in 1950. The same tables subsequently up through 1956 were brought up to date year by year.

[670] Q. The introduction which precedes page 1 of the exhibit, I think, goes into the matter of the different reporting of procedures only, does it not? A. That is right.

Q. Where does the significance of the material on page 1, that appears to be a photocopy, direct copy of a document? A. Yes. These are copies of statistics which are published by the Association of American Railroads in a document called "Railroad Transportation, a Statistical Record." We have reproduced this table so as to show the extent to which the various types of locomotives have been utilized in freight service and in yard service. The earliest figures shown in this table cover the year 1944. Looking at the percentage figures at the right side of the page where they give a per cent distribution of the utilization of locomotives it will be noted that 74.8% of the gross ton miles were moved with steam power, coal-operated power, and 19.76% at that time were moved by steam locomotives using oil power. That is something over 90%, nearly 95% of the operations in 1944 in freight service were conducted with steam power. Looking down now at 1956 only about 8%, a little more than 8% were steam power, and nearly 90% of the operations at that time were pulled by diesel power. The same types of facts appear in the chart at the bottom [671] measuring the utilization of locomotives in yard service.

Q. Column 7, coal steam, did not apparently distinguish between stoker-fired and hand-fired. Is that correct? A. No, it did not.

Q. Do you know after 1944 say, how the 74% plus was distributed as between stoker and hand-fired coal? A. I have never seen any figures on that.

Q. All right. Now, what does the chart on page 2 represent, Mr. Homer? A. Page 2 is a chart I had prepared simply to illustrate the statistics shown on page 1, show the effect of the post-war replacement of locomotives, steam locomotives by diesel locomotives. Look at 1944 I think it is clear that both freight and yard service the steam power was predominant, most trains were pulled by steam power. And looking at 1956, most of the power then was diesel, most of the trains were pulled by diesel power.

Q. I think you have already discussed page 3. I take it that is a photocopy from an ICC publication. A. Yes, from the Annual Accident Bulletin identified.

Q. Now page 4 and page 6, are those also, and page 8, are those also direct copies, or have they been altered by you in any way? A. No, these are photocopies, slightly enlarged of tables [672] that are included in the 1956 Accident Bulletin of the Interstate Commerce Commission. On page 4 there are, in effect, two columns or two tables which are, in a sense, part of the same table. At the top I show the number of train accidents by general causes, and at the bottom the number of train accidents per million motive power miles. That is, of course, the standard exposure factor used for train accidents.

Q. Here has been introduced the factor concerning causes of accidents. (Strike that)—What does the chart on page 5 reveal, Mr. Homer? A. The chart on page 5 has been derived from the figures on page 4, and perhaps the significance of the figures on page 4 can be gleaned from the chart on page 5. We have shown here the steam locomotive era, the average first for 1930 to 1934, and then the average for 1935-39, and contrasted the number of train accidents in those two periods with those that happened by the two periods covered by the chart on the right-hand side of the page, the diesel locomotive era. In both cases it will be noted that the number of accidents was measurably higher in the diesel locomotive era than

in the steam era. Looking at the accident rate at the bottom of the page, that same fact is true. The accident rate per million miles, motive power miles increased from about [673] six in the early period, dropping to five and a fraction in 1935-39, and then in 1951 to 1955 rising to about seven, and getting very close to eight in 1956.

Q. These are train accidents in definition of the ICC that we have discussed before? A. That is right.

Q. Let's go to page 6, please. A. On page 6 we show similar information for the train accidents by class of accidents covering the same periods of years, but breaking the accidents down in this instance by the major categories of accidents—collisions, derailments, and the locomotive accidents which were a subdivision used the Commission in the days of steam locomotives, and of course, the total. The locomotive and motor train miles also are shown here. I think it is interesting to note that the level of operations in 1930 to 1934 and 1935 to 1939 were roughly the same as in 1951 to 1955 and in 1956. These figures are in millions, 1269 in 1930 to 1934, 1258 in 1935 to 1939, 1292 in 1951 to 1955, and 1225 in 1956. Thus, we have several periods with almost exactly the general level of operations. The comparison of the accident levels, collisions and derailments, are shown in the chart on page 7. Again, without going into detail, I think it is clear from this picture that in the diesel locomotive era [674] the number of collisions and the number of derailments was measurably greater than in the steam period shown at the left side of the chart.

Q. Directing your attention to page 6 again. You say that during the period in which density of traffic was the same as between the steam period and the diesel period, that the rate of accidents per locomotive and motor train miles was higher in the diesel period? A. Yes, it was.

Q. You use on page 5 a term that I need to ask you about. Per million motive power miles. What does motive

power miles mean? A. Motive power miles are a short way of saying locomotive and motor train miles.

Q. It does not divide up locomotive and motor train miles depending upon how many diesel units there are? A. No.

Q. It is just a shorthand way? A. Exactly.

Q. And page 7 I think you said is a illustration of the data on page 6? A. Exactly.

Q. Now on page 8, what is the significance of the addition of this chart, Mr. Homer? [675] A. The chart on page 8 lists again the number of accidents for these several periods and shows the amount of damage to railroad property in each of the periods, the average for the year. These figures, I believe, indicate that there has been a very substantial increase in the cost to the railways of the accidents, train accidents that have occurred over the years. Looking primarily at the right-hand side of the page, the lower box where they show total train accidents, the figures show that in the early 1930's the damage to railroad property cost the railroads as a whole something in the neighborhood of ten million dollars. The figure for 1956, the latest figure shown, was fifty-two million dollars. A very substantial five pole wise in the cost of train accidents.

Judge Henley: Has that tabulation been weighted in any way to reflect any change in the value of a dollar?

A. Yes, it has, Your Honor. The Interstate Commerce Commission through the years we have the records very briefly since 1939, increased the standard by which it determined what an accident was by keeping that standard roughly in conformance with an index of railroad materials and supplies.

Judge Henley: I am afraid I didn't ask my question to reflect what I really wanted to know. Have you made [676] any comparisons in terms of constant dollars, that is, for example, how many 1930 dollars is 52,000 1956 dollars? A. I haven't made that general calculation, no,

Your Honor. I think I should say that in a later exhibit I have a comparison beginning in 1939 of the change in the value of the railroad's buying dollar of materials and supplies that can be related to these figures.

Judge Henley: Thank you.

Q. Is there any particular kind of train accidents, Mr. Homer, which is related to the duties performed by employees or the failure of employees to perform duties? A. Yes, there is.

Q. Which category of train accidents is that? A. Railroad collisions. Collisions involving two or more elements of railroad rolling stock.

Q. Have you made a particular analysis of railroad collisions in that connection? A. I have.

Q. I hand the Clerk copies of Intervenors' Exhibit 50 entitled Railroad Collisions, 1961 to 1965. And on page 1 of that document, Mr. Homer, I believe merely repeats the classifications of accidents which we have discussed before. A. Yes, I have.

Q. Now page 2, what is the significance of the chart on page 2? [677] A. On page 2 I have taken the Interstate Commerce Commission's breakdown of all train and train service accidents by broad cause. These facts are reported annually by the Interstate Commerce Commission in its statement number M-400.

Q. Now, these causes, these terms were terms which were developed, as I understand it, by the committee or the group that you were a member back in 1960 or 1961. A. These particular terms are those that go far beyond my own experience. They have been a carry over from a much earlier area of railroading. We did not change them in our revisions of 1960.

Q. What does negligence of employees mean in the sense that it is used by the ICC in classifying accidents? A. I think I can best answer that question by referring to some of the pages which follow, Mr. Youngdahl. I have included beginning on page 4 the code causes of train

accidents in general areas showing those that are described as negligence of employees and due to defects in equipment and roadbed and the miscellaneous causes. Before discussing the specific causes, I think I should call attention to the fact that the railroads are a very competitive business. They compete with each other in terms of giving better service [678] whenever they can. And of course as an industry they compete with the truck and other agencies to try to give better and faster service at all times. Every measure is taken as a result of this to try to step up schedules. Competition is in service, not in price. That is the place where competition is exerted—providing better service. It is very important to get the train made up fast, to get the train over the road fast, to have it broken up and the cars delivered to the consignee as fast as possible.

Judge Van Oosterhout: Do you have an objection, Mr. Lucente?

Mr. Lucente: This is not responsive to the question. His experience in management service, as to this step up in schedule. I object to his continuing along this line. It is a question to which I object.

Judge Van Oosterhout: I am not certain whether he is in the field or not. Let's just ask him the question as to what you want.

Q. What I am primarily interested in in finding out, Mr. Homer, is what the term negligence means in the sense that it is used by the ICC Accident Reporting structure? A. I am sorry, Mr. Youngdahl. I was trying to relate that term in the specifics that lie under that term to the realities of railway operations.

[679] Q. I think you may proceed to do that, as I understand the Court's ruling, Mr. Homer. If the operations of the railroad are a context in which the term can be understood, you may proceed, but it does relate to the meaning of the word "negligence" in this sense. A. Yes. The elements which are included under the term of negli-

gence include all of those things that employees may do, may fail to do, all of the things that may be a result of their failing to see, or failing to hear, all of those that may result from bad judgment or from inability to foresee or anticipate the circumstances that may lead to an accident. All of these things are conditioned by the pressure which comes from that competitive position of the industry.

Q. You called our attention to specific kinds of train accidents are due to so-called negligence of employees which illustrate what your definition? A. Yes, I think I can. Looking down the page first at Cause Code 1003. This deals with the receipt of train orders by the crew, and it points to the misunderstanding by the train or engine crew of a train order. Further on the next column, 1402, the failure to pass a hand signal, including the failure to be in a position to pass a hand signal.

[680] Number 1406, the misunderstanding of a hand signal given by a member of own train or yard crew. These are things, these last two, where there may be some failure of vision to protect against the condition that may give rise to an accident. Now, 1407, acceptance of hand signal given by a member of another train or yard crew. The tempo of operations can within itself make these kinds of errors by employees more likely to happen. Looking down in the next group, 1502, failure to go back or ahead a sufficient distance. Judgment is needed here in spite of the operating rules, because operations are faster today, the trains are heavier and more difficult to stop.

Q. Is that under the category of train flagging on page 4 that you are now? A. Yes, under train flagging. On the next page I could point out a few. There is the failure to test air brakes properly. That could, of course, result from the pressure of wanting to get the train on the road. In the next group, number 1702, hand brakes, failure to secure by hand brakes, including failure to set

hand brakes on a sufficient number of cars. This is the type of circumstance that might result directly from having too few employees in a yard to set the number of cars that need to be set in a particular cut of cars. Looking further down we have under Switches, three that [681] would be related to visibility. 1807, equipment fouling switch. An engineer, of course, doesn't try to have a collision, but if he can't see the equipment ahead fouling the switch, he may hit it. There have been accidents from that cause. And the next two, running off a derail and running through a switch. Those again are things that good visibility might avert, particularly in slow operations. 1902 and 1901, operating at excessive speeds. Again, this calls for exercise of judgment. 1917, the last one in that column, absence of men on or at leading car being pushed. That is another type of accident that might result or cause that might result from having too few employees in operation. There are many others of that kind.

Q. Let me ask you one other definition question. Referring to 1910 and similar references, failure of engineman to keep proper lookout, not otherwise classified. What does engineman mean in that sense? A. Engineman refers to the two members of the engine crew, the engineer and the fireman.

Q. Now, in your analysis of collisions, the first table appears to be that at page 10 of Intervenors' Exhibit 50. What does that table depict, Mr. Home? A. Well, in examining the possible relation or non-relationship of crew consist problems, including the presence of firemen, [682] the most significant or meaningful area would be that group of accidents that would result from employee failures. And the table on page 10 explores that general question. It will be noted that we have broken down the, all train accidents and all collisions into the several major categories of cause. I have used the term "employee error" here instead of "employee negligence." It is in-

tended to cover, however, all of the same causes as are referred to in the official statistics as employee negligence.

Q. Are the other two categories also shorthand—— A. I have abbreviated.

Q. All right, thank you. A. Now, looking at all train accidents, it will be noted that 29½% of all train accidents are caused by the employee error factor, 31% by equipment failure, 16% by roadway defects, and then there are 23% to the cause by other miscellaneous factors. Collisions, however, 90% of collisions are related to employee errors. Only 10% are related to all of the other groups of causes.

Q. This, I take it then, is the basis or a basis for your undergoing the intensive examination of collisions which appears on the following pages? A. Yes.

Q. And turning to page 11, what does that depict, Mr. Homer? [683] A. First, I think I should explain the general format of the table, as it will be used in a number of tables which I shall present later. I have shown here for all of the months, individual months, of the years 1961 through 1956 the number of collisions on United States railways. I have shown the average for the three years, 1961, 1962 and 1963, showing the average for each month, within that three year period. The use of an average for each month is necessary because there always is some seasonal factor in all railroad accidents, somewhat less so for collisions, but nevertheless, present there. I have taken then the figures for the period subsequent to the effect of the Arbitration Award, that is Arbitration Award 282, and I have drawn a black border around those months so that in very easy inspection the change in the number of collisions since the effect of that law can be readily determined. Looking now at 1964 it will be noted that in the first four months there was a slight increase in the number of collisions in three of the four months, but a decline in January. For the four month period as a whole there were ninety collision, which is

about 11% above the number of collisions on the average in the three preceding years. Going to April there was an immediate jump, or going to May. This is the first month, incidentally, of [684] the effect of the Arbitration Award. There was an immediate jump to 104 collisions. Now that is greater than the average for May and greater than any of the individual months in the preceding years. We go down the line for each successive month, and in every instance the 1964 collisions increased well above the average of the same period in the preceding three years. I have used a three year period here because with these figures as with many accident and casualty figures the figure for an individual month, or an individual year can be an unreliable base at times. It is better to get a base that consists of a number of such apparently like periods. And I have taken the three year average for that reason.

Q. Why did you stop with June, 1966? A. I didn't know that I had. June, 1966 was above the average for the three preceding years. In July, 1964—oh, I see, you referred to June, 1966?

Q. Yes. A. That was the latest figure available when this table was prepared, Mr. Youngdahl. I understand from the presentation made by the railroads that July and August figures are now available, but I did not have them, and I don't have them here. I might call attention to just a few summary relationships. Looking at the last eight months of 1964 [685] there were 109 on an average per month. Now that is a 25% increase over the average of the same months in the preceding years. Looking at the whole year 1965, 115 was a 35% jump above the average of the three years.

Q. These percentages that you are giving us that is, they don't appear—— A. They don't appear on the table.

Q. All right. A. Now, looking at the last four months where there was another general jump, the average of

those last four months, March, April, May and June, was 134. Now this is a 61% increase over the level of the three year base.

Q. I lost you in that last one, Mr. Homer. A. I made simply an average of the number that occurred in the last four months that are covered by this table, March through June of 1966.

Q. I see. And you have made separate calculations that you have just related to us? A. Yes.

Q. All right. Now that first table on page 11 that you have just described is raw data about collisions, I suppose? A. Yes.

Q. The next then interprets them in the sense of million locomotive and motor train miles? [686] A. Yes.

Q. Is that correct? A. I have used the standard exposure for train accidents.

Q. Would you tell us what that chart shows? A. The format is the same. I think I shall refer just to a few of the summary figures. First of all looking at the first four months, the average of the first four months in the three year period was 1.08 collisions per million locomotive and motor train miles. In 1964 the comparable average was 1.17. Now that is an increase of 8%. In the last eight months, however, the rate rose to 1.39 as compared to 1.13 in the average period. That is a 23% jump in the collision rate in that period. Looking at the figures for the whole year, 1965, the rate rose to 1.46. That is a 32% jump over the three year average prior to the effective date of Arbitration Award 282. Again I have taken the figures for the last four months and averaged them, because they showed a spectacular jump in these last months as compared with the preceding years, 1.66, 1.63, 1.66 and 1.69. Averaging exactly 1.66. Now this was 55% over the similar average which was 1.07 for the three year period.

Q. I don't think you need to go into the note at the bottom of the chart, in general it represents certain

statistical [687] adjustments which were necessary to make—— A. Perhaps I should refer to it, then it will be clear. Mr. Greer spoke in connection with his presentation of statistics of the need to adjust locomotive and motor train miles because of the change in the method of reporting such miles after 1964. He used a method which applied to the individual months simply the average factor that he says he determined was appropriate for each year. Now, of course, this factor will vary by individual months, and I chose a different general method to make this adjustment. I assumed that for each engineer mile you will have a locomotive mile, and for each engineer hour in yard service you will have six locomotive miles. That, of course, is the standard factor used by the Interstate Commerce Commission for that purpose. And taking the engineer mile thus I got a true picture of the monthly variation of locomotive miles. Now those, then, had to be expanded from a Class 1 basis to an all railway basis. Now that was done on the basis of the simple ratio technique that is described in the footnote.

Q. Does the table on page 13 relate in any way to the immediately preceding tables, Mr. Homer? A. Yes, I have put on page 13 the collision rates for the years, the summary rates for the years. I have shown the per cent of trips operated without firemen, and in [688] column on the extreme right of the page the total number of trips operated in the period. There is, of course, a relationship between the total number of trips and the potential for collisions. In general mathematical terms the potential for collisions rises about twice as fast as the number of trips run. I have computed the formula. I don't know that it will be of interest to the Court, but if we let X equal the number of trips in one direction, and Y equal the number of trips in the other direction, the potential collisions equal XY plus X plus Y minus 2. Now that is a formula for determining that potential which will in-

clude both head end collisions and rear end collisions. Application for that formula to the number of trips develops the general fact that the potential increases about twice as fast as the number of trips.

Q. I don't have the familiarity to question you any further on that formula. A. Well, I would like to call attention, Mr. Youngdahl, to the relationship which is, I believe, quite clear on this table. The number of trips did not increase appreciably from 1961 to 1963, but there was an increase in the collision rate, the same one that is shown on the preceding page. The first four months of 1964 there was a slight drop below the level of 1963. Now during this whole period up through April of [689] 1964 firemen were on most trips. There were a very few trips which operated without fireman. In the last eight months of the year, however, a number of firemen were removed, 31.4% operated without firemen, and the rate immediately jumped to 1.39. There was a further jump in 1965 to 1.46 and a later jump again in the first six months of 1966 to 1.53. Suggests a relationship between the removal of firemen as a result of the Arbitration Award and the collision rates. These figures are shown graphically in chart on page 14. I think perhaps it needs no further comment.

Q. I see on page 15, Mr. Homer, you still continue to deal with collision rate, but you have a division of carriers between, at a 47.4% location. What is the basis of that division in the chart on page 15? A. Well, Mr. Greer who appeared here, appeared also in the Wisconsin litigation, and Mr. Greer in that litigation divided the railroads into these two groups. In his exhibit he showed only the train accident rate. He did not show the collision rate. In that particular showing he had 33 carriers which operated more than 47.4% of their freight and yard service without fireman, and carriers which operated less than that proportion without fireman. We have in

the 33 carriers thus the carriers which removed a substantially larger number of firemen than in the 31 carriers. [690] Q. Thirty-one carriers have a poorer crew, can you put it that way? A. Yes.

Q. And what then does the collision rate material on page 15 show as to, as between those two groups? A. Well, looking at the very similar figures, there was not a great deal of difference between the two groups of carriers prior to 1964. In 1965, however, the rate of the 33 carriers was 36.9% above the average of the preceding period, in the carriers which had removed a substantial number of the firemen. In those which retained a larger proportion of the firemen, the collision rate rose only by 16.1%.

Q. Mr. Homer, has there been available to you the data on which this division between 31 and 33 carriers is based? A. Only partially, Mr. Youngdahl.

Q. What has been the problem or deficiency in that respect? A. I can derive from the quarterly reports of the Interstate Commerce Commission M-400 the number of collisions or the number of accidents, but I cannot derive for the years prior to 1965 for these individual railroads reliable and comparable data for locomotive and motor train miles. Those could be obtained by me only for this particular period only by working backwards. Mr. Greer's exhibit in [691] Wisconsin, as here, did not show the number of train accidents, nor did he furnish the number of locomotive and motor train miles that were used in these calculations. But taking the train accident table which he submitted, it was possible for me to work backwards, taking the number of train accidents they were derived from, and therein derive his exposure factors for these two groups.

Q. What is the difference, Mr. Homer, between the data contained on page 15 and that contained on page 16? A. On page 16 I made the same type of calculation for the same group of carriers using train miles in trans-

portation service rather than locomotive and motor train miles.

Q. Why did you select transportation service, again? A. Because the locomotive and motor train miles used by Mr. Greer were not available to me. I had no way to get them except by this backward process that I discussed. I have included this table here to show that whether you use the locomotive and motor train miles as shown on page 15 or the transportation service train miles as shown on page 16, the basic changes from year to year are almost identical. They are very nearly the same. I can illustrate that by reference to the 64 carriers.

Q. The 64 carriers is the total of the two groups? A. The total of the two groups. Looking at page 15 the change [692] of the sixty-four carriers from 1962 to 1963 was 5.3%. That is in the ratio, collision ratio. The ratio based on the transportation service train miles was 4.9%. Very nearly the same relationship. Going from the next period of years from 1963 to 1964, the change was 10.8% on the basis of the locomotive miles, and 11% on the basis of the transportation miles.

Q. The last series of figures you have given us relate only to the comparison between pages 15 and 16? A. Yes.

Q. Whether or not those two standards used make much substantial difference in the comparing of collisions? A. Exactly.

Q. And the conclusion is that they do not? A. They do not.

Q. And that the results of the collision analysis as between the two groups of railroads selected by the railroad in the Wisconsin case reveals that those with fuller crews have substantially less increase in accident rates since 1964. Is that right? A. That is right. Looking at page 15, the difference between the two groups was a gain for one of 36.9 as against 16.1. The comparison in the other chart is 39.1 as against 18.5. So

the relative position is [693] about the same on one basis as the other.

* * * * *

Q. I hand the Clerk Intervenors' Exhibits 51, 52 and 53. I ask you Mr. Homer, in this case as distinguished from the Wisconsin case, the railroads have made a different grouping of carriers as between those with more firemen and those with fewer firemen per crew. Did you do the same kind of analysis, at my request, based upon that grouping that the railroads used in this Arkansas case? A. I have.

Q. And do Intervenors' Exhibits 51, 52 and 53 reflect an analysis based upon that new division that we just heard about in this case? A. They do.

Q. Would you tell us, please, first about Intervenors' Exhibit 51. A. In Exhibit 51 I have taken simply the raw data on collisions and have shown them for the two groups of carriers. There wasn't a great difference in the number of collisions in [694] the two groups for the earlier years. In 1961 there were 484 for one group as against 449 for the other group, a difference of 35. In the second year, 1962, 484 as against 440, a difference of 44. And then a slightly larger difference, 75, in the third year. The average difference for the three years is 52. In 1964, a year now which had the partial effect of Arbitration Award 282, the difference between the two groups immediately jumped to 130. The 35 carriers which had taken off a substantial number of firemen jumped to 612. The 32 carriers which took off a lesser number jumped only to 482. Both groups, of course, in the next year, 1965, took off a larger proportion of firemen, so both showed an increase. But in 1965 the group which had taken off the larger number jumped to 710. The other group which operated with many more firemen in service, to 535. Now there has been some evening up of this trend in 1966. The difference between the two dropped to 131. There still is, however, in terms of per-

centage relationship, a significant difference between the two groups of carriers—44.9 on the one hand, as against 32.4%.

Q. Proceeding, if we can, Mr. Homer, to Intervenors' Exhibit 52, perhaps we can cut this a little short by asking you [695] if that chart isn't identical, with the exception of the different grouping to the chart appearing on page 15 of Intervenors' Exhibit 50? A. I believe it was page 12.

Q. Let me withdraw the question, Mr. Homer. The Intervenors' Exhibit 52, we are now talking about. What, on that exhibit what does that show? Does that show the same thing that the table in the two preceding exhibits showed, except it is a different grouping and it contains a little longer number of years? A. Yes. We have it geared first to the format of taking all the years, 1961, 1962 and 1963, and the average for the three years, and then shown the collision rate in this case based on transportation service train miles for each of the periods.

Q. Now, 51 and 52, that is, Intervenors' Exhibit 51 and 52, the last two charts we have just talked about, they relate to the documents which you have prepared prior to this case, based upon the Wisconsin grouping. Is that correct? A. Yes.

Q. And they had just asked for the Arkansas grouping which was presented by the railroads in this case? A. Yes.

Q. When I say Arkansas grouping, I mean in the Arkansas case. Now, Intervenors' Exhibit 53, on the other hand, does [696] not have a comparable table. In your original presentation, which is in Intervenors' Exhibit 50. What does it relate to? A. Mr. Greer's exhibit, page 12, provided a number of percentage changes year by year. All Exhibit 53 provides is a few more such percentage changes.

Q. You are talking about page 12 of Plaintiffs' Exhibit 109, the document which Mr. Greer, submitted in con-

nection with Mr. Greer's testimony? A. Yes, I am. It is the same grouping of carriers, and the figures are derived exactly from his exhibit. I have shown here in the change in collision rates at the bottom of the page, the change from 1962 to 1965, wherein the one group which took a lot of firemen off the change was 29.8%, and the other group only 8.8%. Going from 1962 to 1966, the figure for the one group was 36.4 as against 28.9. Now going from 1963, another one of the years in his exhibit, to 1965, the difference was 37.7 for the one group which removed a great number of firemen, as compared to 12.7 for the other group. 1963 to 1966, 44.7 as against 33.6. Now, what I have done is go to periods before the effect of Arbitration 282 and related them to the years 1965 and 1966, when we have the clear operation of the Arbitration Award.

Q. In that last group of yearly contrasts you have omitted [697] altogether the year 1964, the year which was part of each? A. That was a mixture.

Q. And, if I understand, what material does this add to Plaintiffs' Exhibit 109, page 12? A. It only makes available to the Court additional relationships between the early years and the later years which were not supplied on page 12 of Exhibit 109.

Q. All right.

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March 24, 1967.

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Q. Mr. Homer, yesterday we dealt with material prepared by you that had to do with physical methods and trends in railroad accident experience generally, and trends with specific reference to collisions. Have you done further analysis of train accidents on United States railroads? [698] A. I have.

Q. I now hand the Clerk three copies of a document

marked Intervenors' Exhibit 54 that is entitled "Train Accidents, All United States Railroads, 1961-1966." First, Mr. Homer, train accidents, I take it, again refers to the categories of accidents established by the Interstate Commerce Commission. Is that correct? A. That is correct.

Q. What besides collisions are included in train accidents, just for our ready reference here? A. Train accidents include collisions, derailments, and other accidents, which, of course, would include grade crossing accidents not involving collision and derailment, and miscellaneous accidents.

Q. As to derailments and other accidents, as to all those accidents included in the term "train accidents" but excluding collision, is the size and composition and function of the crew related in any way to those other accidents in addition to collisions? A. It is related, but it is, of course, a less direct relationship, than is true of collisions.

Q. Now referring to page 1 of that document, Mr. Homer, would you please explain to us what those figures show. A. Using the same format that I used in connection with the [699] data covering collisions, I have shown month by month the trend of train accidents for the period 1961 through 1966. I shall not review these statistics in detail. They show the same general fact that train accidents have increased through the years, and have increased remarkably since the effect of Award 282. A close study of these figures will reveal that this change, although slightly greater after the effect of 282, not so strickingly great a break with this fast trend as was true with collisions.

Q. Is the rate of increase of train accidents generally did that rate go up after May, 1964, or did the rate of train accidents generally go up with a speed consistent with previous periods? I am having trouble with the terminology, Mr. Homer. Do you understand my ques-

tion? A. I think I do, Mr. Youngdahl. I think perhaps the best response to your question, as I understand it, is to say that the train accident data reflect a more or less continuance of a trend of increasing accidents that was true of the previous years. Of course, many of these accidents are caused by deterioration of railroad equipment and the under-maintenance of railroad track and structure. And so there was an increase in train accidents due to factors wholly removed from the effect of the Arbitration Award. Therefore, it takes a very [700] close inspection to detect the difference in the impact of that award. It has to be related, in other words, not just to the change which followed immediately, but to the trend that was true of train accidents before and after the effect of the Award.

Q. Pages 1 and 2 of this document, which is Intervenors' Exhibit 54, are then comparable and subject to the same statistical explanation that you gave us in connection with collisions? A. That is correct.

Q. Now, let's look at page 3, if you would, of this document. Explain, please, what you mean by preliminary report of train accidents. A. The Interstate Commerce Commission based on its first reports of train accidents each month prepares a preliminary report it identifies as M-450. Now this report is frequently published very soon after the month in which the data have been collected. It usually is an understatement of the total number of accidents that occur. And each subsequent M-400 report that is issued shows universally, year by year, a slightly larger number of accidents than was reported on the M-450. So it is an understatement, but it is the most nearly up to date information we can get. The preliminary report, for example, [701] here shown on this exhibit covers the full calendar year 1966. In my own statistics I have not been able to present M-400 information, that is final information, beyond the month of June, 1966. In order to make these roughly comparable

it has been necessary to use preliminary information for all periods.

Q. All right. Have you then, Mr. Homer, made an analysis of the causes of increased train accidents in addition to the analysis of collisions which we have already talked about? A. I have.

Q. I now hand to the Clerk copies of Intervenors' Exhibit 55 and 56, Intervenors' Exhibit 55 being entitled "Major Causes of Increased Train Accidents, 1961-1964," and Intervenors' Exhibit 56 being entitled "Important Specific Causes of Increased Train Accidents Resulting From Employee Failures, 1961-1964." Referring first to Intervenors' Exhibit 55, the first of those two documents, Mr. Homer, what was the purpose of assembling these figures? A. I thought it would be useful to have before the Court some of the general information on causes in the categories of the ICC coding system which showed substantial increases in the period between 1961 to 1963 level, and 1964. Unfortunately, these data have not yet been published for [702] 1965. The first group, Employee Failures, with respect to hand brakes, switches and miscellaneous, these are the three major categories in the so-called employee negligence group where there was a substantial increase, and where the number of accidents covered was in itself substantial. There are some major areas of cause where the number of accidents that occur are so slight as to be not significant. A hundred per cent increase, for example, from two to four accidents per year, I would not feel worthy to report. It is the type of statistical thing that can have no relation to any circumstances, but these particular areas are major accident groups of causes which did increase over this period. The first one shown, employees failures with respect to hand brakes increased from the 1961 to 1963 average from 237 such accidents to 321. The next group, from 276 to 366. It will be noted that for that second group the negligence with reference to switches, that

there was an increase from 1961 to 1962 and then a slight drop between 1962 and 1963, and then a very substantial jump in 1964. The miscellaneous category includes a number of specific causes which are mentioned in the footnote, such as operating at excessive speed, failure to keep proper lookout, improper handling of locomotives, the absence [703] of men on leading cars being pushed and other similar types of failures. This particular group went down between 1961 and 1962, and then back up in 1963. There was, however, a significant increase in 1964 over the average of the three years. Among the maintenance of equipment defects, the category of wheel and axle defects has perhaps had as great a rise as any group in all of the group of causes. Wheel and axle defects would, of course, include the hotbox which has been a major cause of derailments through the years. The trend of wheel and axle defects went down from 1961 to 1962 and then up from 1962 to 1963. There was a very substantial jump above this three year level in 1964. The maintenance of way defects where there was a substantial increase include those defects of rails and joints, of frogs and switches, and of other roadway items, which would include such things as track alignment and curvatures and clearance, both side clearance and clearance above the rolling stock and the surface and gauge of track. This particular group also increased from 1961 to 1962 and to 1963, then had a very substantial increase from the average in 1964.

Q. Mr. Homer, the wheel and axle defects and the maintenance of way and structure defects that you have at the bottom [704] half of this chart. Are they related in any way to the consist of the crew? A. They are related to the extent to which the crew members can detect such conditions before an accident occurs. Among the duties of the brakemen, for example, is the continued observation of the train whenever it goes around a curve, look back and see, for example, if there are hotboxes,

potential difficulties there which might derail the train. And the engine crew is, of course, supposed to watch for rail defects in its forward motion. Of course, traveling at high speeds, it would be impossible to make any such, to recognize any such things ahead of time. In slow operations in yard operations there would be many times where a significant defect in the rail might be detected.

Q. Do I understand then as to Intervenors' Exhibit 55, that the basis for the selection was one, a large volume of accidents in relation to the total, and two, those types of accidents which, in your opinion, were related to the size of the crew and crew performance? A. Well, that isn't correct. The basis for selection was only the first of those two. These are the major categories of accident causes which increased, and they were selected on the basis of that element, without [705] reference to the Arbitration Award or any other.

Q. Oh, these are then the categories of increased accidents in that period without regard to the cause, other than as specified in the listing? A. Yes. That should be remembered the major causes where there was a real considerable number of such accidents and where there was an increase between 1963 and 1964.

Q. Two standards for selection then, as you have explained them to me now, are one, where there was a large volume of this kind of occurrence, and two, where there was a substantial increase during the period in question? A. Yes.

Q. Now, what is the difference in that respect and others between Intervenors' Exhibit 55 and Intervenors' Exhibit 56, the next document? A. Well, Intervenors' Exhibit 56——

Q. You don't have the numbers there, but it important specific causes document. A. In this case I again examined the Accident Bulletins in the employee negligence groups, and selected specific causes. Here I was guided

by both considerations. First of all, the one or two accident category, of course, would not be worthy of even examining, because that type of statistical thing has no value. But I did think here [706] deliberately of those types of circumstances which might relate to the membership of the crew.

Q. Here you did you what I attributed incorrectly to you as to the base given? A. Exactly.

Q. If you will then go ahead and tell us what this chart shows. A. First of all I have 1307, stop signal or board disregard of. This is, of course, a visibility circumstance where given visibility in time certainly the engine crew will stop the train before it runs through a red light, and has an accident.

Q. What is a board in the sense of this term? A. That is a general term used for a signal.

Q. So it means disregard of a stop signal. That is really what this is? A. Yes, that is right.

Q. All right, go ahead. A. There was very little variation from 1961, 1962 and 1963 in this type of accident. The average of the three years was 13, almost the same for each of the three years. In 1964 this type of accident increased to 28, just a little better than doubled in this period. This is, as I said a visibility type of circumstance. 1702, failure to secure [707] by hand brake, including failure to set hand brakes on sufficient number of cars, this particular circumstance would be related certainly to the number of brakemen who are available to set the hand brakes. Here again we have had a slight increase from 1961 to 1962 to 1963, and then a very substantial increase from 1963 to 1964. The average for the three years was 200. It increased to 272 in 1964.

Q. Before you proceed to the next category, I have a question about the latter part of term, sufficient number of cars. Sufficient for what? A. Sufficient to hold those cars in position.

Q. Okay, proceed please. A. Now, the next three acci-

dent groups shown here, 1802, 1807 and 1808 and 1809, again are to the extent that they are related to crew consist or related to the visibility question. An improperly set switch, the failure of the crew, the ground crew, to align the switch correctly may be the fundamental cause of the accident. But the visibility question enters in the ability of the engineman to see this improper condition of the track before they run through it. There has been, as you see, some increase in this type of accident. It is not, however, as marked an increase as in some of the other categories. There was a gradual [708] increase from 1961 to 1962, and 1963, and then a slightly larger jump in 1964.

Q. You say inability of the enginemen. Would it ever occur the inability of the train crew to see might be related to any of those three switching matters? A. Well, of course, if a head brakeman happened to be riding in the engine he would be in the same position, of course, as a fireman in this respect, and in a reverse movement presumably the train crew could do so. It is rather doubtful, however, that they could take effective action, other than they could pull the emergency brake immediately. It could happen, however.

Q. All right, would you proceed, please. A. Now, the next one, equipment fouling switch, is a category that has had a very substantial increase. It was not the cause of a great many accidents in any one of these three years, 1961, 1962, and 1963. The average for the group was only 12 for the three years. In 1964 it jumped more than four times, more than four fold from that average up to 56. Now this is the type of accident that occurs, has occurred in yard service. It is a circumstance where normally the engineer is alone in the cab of the locomotive, and if equipment can foul a switch on the left side of the track, or on his blind side, he may not see the equipment [709] in time to stop before the collision takes place. There have been a number of individual T Forms that I have

examined that describe just this type of accident. 1808 and 1809 again are visibility accidents. There have been a considerable number of instances in 1964 greater in the earlier years where trains have run through open switches and run off derail, and thus derailed the locomotive or the cars. Now this again is something that an engineer would avoid if he could see the condition before he runs through it. Now the next two are excessive speed causes. Now these, of course, would relate substantially to the judgment of the employees, the engine service employees. We notice that the first of these two, 1901, has not shown an increase. From 1961 to 1962 there was a decline. A further decline in 1963, and then the average for the three years was 62. But 1964 fell below that average. There was in this case, although one might expect that to have some relation to the presence or absence of a fireman, there was nevertheless a drop in this type of accident.

Q. Over the three year average? A. Over the three year average. Slightly above 1963.

Q. The previous decline was steady over the three years, and the decline was reversed in 1964? [710] A. That is true.

Q. Okay. A. Now 1902 was excessive speed in other than yard limits. This is on the road. There were 22 of these accidents in 1961. It dropped to five in 1962, and went then up to 12 in 1963, and the average of the three year period was 13. The 1964 jumped back up to 22. This particular trend would apparently be so variable as perhaps not to have a great deal of meaning. Nevertheless, in 1964 the level jumped up to the highest level of the previous period.

Judge Henley: Let me interrupt a moment. With respect to 1901 and 1902, how would those accidents be related to number of crewmen, this excessive speed? A. I think it would be related only to the presence or absence of a fireman, Your Honor. Excessive speed is, of course,

a matter of judgment as to what is the correct speed to operate at under given circumstances, what it might be. The presence of two experienced enginemen in the cab of a locomotive could provide an extra basis for judgmen A fireman might, for example, feel the engineer was running faster than was proper under the circumstances and might warn the engineer. Now that would be particularly true, of course, in road service. [711] A. The next cause, 1910, is a visibility cause, failure of enginemen to keep proper lookout not otherwise classified. There is no very clear trend here. There was an increase from 1961 to 1962, a further slight increase in 1963, and the three year average was 78. In 1964, however, the number of these accidents dropped to 1965. These are visibility accidents, or in some way related to the others that I have indicated as visibility accidents. If they couldn't ascribe it to, say, any of the others—stop signal, for example, running through it—that an accident occurred for any reason because of this failure, it was included. I thought it appropriate to include it here. 1917, absence of a man on or at leading car being pushed, would relate to the total presence of crew members. The rules would provide that a man should be on the leading car, but if the crew was short-handed, particularly in yard service in switching operations, the practical situation might require an immediate switching operation, and no one would be available in the crew to occupy that position, and the operation took place nevertheless. This particular group of accidents has had a very striking increase in the last year. Now I have added up this basic group of causes, show the figures at the bottom of the page. There has been an increase from 645 [712] to 733 to 783 in this period. And for all the causes put together an average of 720 for the three year period, and then a very dramatic jump to 981 such accidents in the year 1964. I call attention to the accident rate which is used here. This is not an accident

rate in the sense that I have used it in other exhibits or will use it in the future. This is not based on an index of exposure. I have here computed the accident rate per million man hours in train and engine service of all the railroads. This was done because these are accidents which are related to the so-called negligence of employees. It occurred to me that it would be most useful to relate it to the hours of the employees to whose negligence it is ascribed. That this rate, therefore, is not like a casualty rate, or even a train accident rate as used in other parts of my material. The rate nevertheless it is quite clear, showed a very significant increase from an average for the three year period of 1.76 up to 2.43 in 1964.

Q. Mr. Homer, it strikes me that there is another difference between these last two charts other than what I asked you about at least. Intervenors' Exhibit 55, the preceding chart, your basis for selection I think you told us was that you took all the causes of accidents, looked at all [713] the causes of accidents, and you chose them on the ground that one, may have a substantial volume during the period in question, and two, that the volume increased substantially from the three year average to 1964. A. That is correct.

Q. Now, on the other hand, Intervenors' Exhibit 56, you have some elements there that actually decreased from the three year average to 1964. One in particular, failure of enginemen to keep proper lookout. A. That is correct.

Q. So the basis of selection in the Intervenors' Exhibit 56 did not then involve those that necessarily showed an increase from the three year period to 1964? A. No, it did not.

Q. What—for my benefit at least—what again was the basis for selection of the important specific causes in Intervenors' Exhibit 56? A. Well, I reviewed these specific causes with enginemen and brakemen here in Arkansas prior to making this selection, and we made the collective

judgments—it was my initial judgment, but it was verified through them—that these causes certainly would have some relationship, one would expect some relationship to the number of men on the crew.

[714] Q. You include all such causes whether your investigation revealed to you whether or not they showed an increase in 1964? A. We made the examination without reference to any figures. We, in effect, went over the individual cause codes, which we have reviewed in previous exhibits.

Q. All right, thank you, Mr. Homer. A. I think I ought to clarify one thing. In Exhibit 55 the categories here are major groups of causes, they are not individual causes. They do not—for example, the 1702, the 1700 group is one element in the group of hand brake causes. These are broad categories on page 55, these are individual causes in 56.

Q. Now, I hand the Clerk copies of Intervenors' Exhibit 57 entitled "Railroad Casualties, 1961-1966". I assume we are now moving, Mr. Homer, from the train accident data to the casualty data. A. That is correct.

Q. Would you please explain to us the documents involved in Intervenors' Exhibit 57? A. I shall. On page 1 of this exhibit I have shown the month by month trend of the number of casualties in train operations.

Q. You told us yesterday that there is a seasonal variation [715] as to train accidents. Is there also a seasonal variation as to casualties? A. Yes, there is.

Q. All right, proceed, please. A. This information is, of course, most meaningful examined only in the light of that seasonal fact. I would like to review in some detail the trend of these individual months because I think that the change which occurred in 1964 is shown very dramatically in these figures. Looking first at the first four months it will be noted that in January, 1964, there were 880 casualties in train operations. Now, this was lower

than any of the other Januarys shown here. It was lower than all three of them. In February the number was 805, and again it was lower than any of the other Januarys shown. In March it 828. It was a little bit above the 1961 figure, but was below the figures for both 1962 and 1963. Then in April 813. The figure was somewhat higher than the other three figures, and substantially higher than the average. In May of 1964 the Arbitration Award was put into effect, and the number of casualties immediately jumped to 919. Now, that is quite clearly higher than any other May. Of course, higher than the average. In June there were 950, again a very significant jump above each of the other Junes. [716] Now, without following through each individual month, I call attention of the Court to the fact that in this whole period after April, 1964, throughout the rest of that year, the number of casualties to train operation employees in this train operation increased above every other comparable month in the preceding years with one sole exception. In the month of December, 1964, the number of casualties, 984. Now, that was below the number shown for December, 1963, but in every other instance the level of these casualties exceeded the comparable month of all three of these years, without exception.

Q. I think Mr. Greer might have already told us, but was there anything about December, 1963, that you were aware of which might account for that figure there? A. Well, 1963 was a severe month in terms of weather, and there were more casualties because of that fact.

Q. What in the sense of these charts and the ICC data does the term "casualty" cover? A. It covers in this case train and engine service employees who are killed or injured in train operations.

Q. Had there been prior to May, 1964, any kind of a long-term trend with regard to casualties of these categories of employees? A. I think it was variable. It is a

little difficult to [717] say that in this particular period for which we have comparable figures that there was a trend in either direction.

Q. Have you related the casualty figures on page 1 to the exposure factor which you told us about yesterday in terms of casualty rates, namely, man hours? A. Yes, I have. Now, I think that before I review those I should point to the fact in 1965 and 1966, although in general the level of casualties remained somewhat above the earlier years, particularly in 1965, there was a decline in 1966 below some of those levels. Now, this is, I am going to deal with some of the later materials that I shall present, but this was very substantially due to the decline in employment of these classes, and thus a decline in the exposure of these individuals during these later periods.

Q. And that, then, I take it, is reflected in the date on page 2? A. On page 2.

Q. Will you proceed to explain that, please? A. Now, looking first again at the experience in 1964, I call the Court's attention to the fact that in the last eight months of 1964 the number of casualties to these employees month by month exceeded the number of casualties [718] in each of the similar months in the earlier period. When that is converted to a casualty rate there is no exception, not even with reference to December of 1963. There is no exception when the casualty rate in the post-April, 1964, period was not higher than the casualty rate in the comparable months of the preceding years. In the years after 1964 there was a general continuing for a number of months in the casualty rate rise, but in many months somewhat of a leveling off. For example, in the last eight months of 1965, the rate was slightly lower than in the comparable period of 1964. It still remained very substantially above the same period of 1963 and the earlier years. The 1966, again there has been a leveling off, but at a somewhat level than in the pre-Arbitration period.

Q. Did you make any calculation, Mr. Homer, of the casualties rates in the terms of the breakdown of the railroads, presented by the railroads in the Wisconsin Full-Crew case? A. I did.

Q. And is that the document which appears on page 3 of this exhibit? A. It is.

Q. Would you please explain that chart to us. I don't think you have to explain the basis of division. I think you went [719] into that yesterday. A. It is exactly the same basis as was discussed in the earlier exhibits for collisions. This—I think I should explain what the casualty rates are. The casualties for train and engine service employees, by individual railroads, are not available in any published form by the Interstate Commerce Commission. It was necessary, therefore, to take the casualties to all employees, but restricted to employees in train operation accidents. Most of them, of course, would be train and engine service employees, but other employees are hurt in such accidents. Now, these data have been shown here only in terms of the casualty rate per million man hours worked. I will point out only the fact that in the earlier years the rate of the 31 carriers, which are the carriers which laid off a smaller proportion of their firemen, was higher than the rate of the other groups. Of course, during this period they all operated with firemen, in the years 1961, 1962 and 1963. The average for the three year period was 691 for the group that subsequently laid off a great many firemen, and 738 for the group that retained more firemen in service. After, however, the effect of the Arbitration Award, going to 1965, it will be noted that the rate on the 33 carriers where a significant number of firemen were removed, actually rose above the rate of [720] the other group of carriers. The increase for the 33 was 9.1%, the increase for the 31, 1.9%.

Q. I am looking at page 3 contrasted with page 2. Page

2 covers both the engine crew and the train crew in the sense of that term that has been used in this case? A. That is correct.

Q. And page 3 you have already told us covers all employees? A. All employees.

Q. The rate is in a much different category. It is in the sixes and sevens on page 3, but in the twenties on page 2. That, I take it, reflects the difference in incidents of accidents to casualties to people who actually were operating personnel as compared to other employees? A. Yes, and in computing the rates it was necessary to use the man hours of all of the employees rather than just the train and engine service employees.

Q. Did you then, upon the advice by me of the division made in the Arkansas case by the railroads in categories of railroads, did you then compute the casualty rate as to that division? A. I did.

Q. I hand the Clerk copies of Intervenors' Exhibit 58 entitled "Casualty Rates, Sixty-Seven Railroads, 1961-1966." Are these the sixty-seven railroads which the railroads have [721] used in this case as a division system? A. They are.

Q. What does that show? A. Without going into any great detail in describing the exhibit, which follows the same form as the previous exhibits, I call attention to the fact that the 35 carriers which operated more than 52% of their services without firemen increased the casualty rate 10½% during this period, whereas the 32 carriers who operated somewhat less than that percentage, actually had a decrease in their casualty rate of 3.3% over this period.

Q. There is some overlapping, I assume, between the year 1965 and the year ended June 30, 1966? A. Yes, of course.

Q. I note that page 3 of the preceding exhibit, Intervenors' Exhibit 57, has in the title of the chart "employ-

ees on duty'' and assume that, although that is not in the title here, that it does refer to employees on duty generally as distinguished from train and engine service employees? A. Yes.

Q. In determining casualty rate, are the trends in passenger operations a factor to take into account? A. Yes, they are.

Q. And have you made a computation of casualties in passenger [722] operations in order to have that information before the Court? A. I have.

Q. I hand the Clerk Intervenors' Exhibit 59, entitled "Casualties in Passenger Operations", et cetra, 1961 to 1965. Mr. Greer discussed this matter, Mr. Homer, and I think on page 6 of Plaintiffs' Exhibit 109 dealt with it. Have you examined that document as well as other figures available to you? A. Yes, I have.

Q. And what, in view of that, does Intervenors' Exhibit 59 show? A. I think it is clear from the figures which are shown on Exhibit 59 that there has been in 1964 and in 1965 a very sharp reduction to the number of passenger casualties on American railroads. In the preceding years from 1961 to 1963 the number of passengers killed and injured increased from 1895 to 2114, and then to 2145 in 1963. The average, of course, for the three years was 2051. But in 1964 the number dropped substantially to 1493, and then dropped even further in 1965 to 1197. When in, as in Exhibit 109, comparisons are made based on the total number of casualties to all individuals, as on page 6 of Exhibit 109, the decline in the number of passenger casualties has a very sharp effect, striking effect. It is a very large change, a [723] change actually of a thousand casualties as between 1963 and 1965.

Judge Van Oosterhout: There were less trains in 1965 than 1963?

A. 1965 to 1963?

Judge Van Oosterhout: The passenger business had been decreasing?

A. Yes.

Judge Van Oosterhout: There were not as many in operation. Wouldn't that have an effect on the passenger casualties?

A. Oh, yes, unquestionably. Of course, there wasn't that large a decline, Your Honor, in passenger service, but you are quite correct. The decline in passenger service affected it.

Q. In view of the data on Intervenors' Exhibit 59, and anything else in the record including the railroads' exhibit to which you referred, what is the significance of the casualty in passenger operations figures in evaluating casualties in other respects that might be more material here in this court? A. Well, of course, there has been no change in the crew consist or in the presence or absence of firemen in passenger service, and so this decline in passenger casualties and employee casualties in passenger service is wholly unrelated to the change in crew consist.

Q. We know what the situation is in Arkansas, I think, because [724] of the Arkansas statute which is not involved in this case, but in other states what is the situation as to the presence or absence of a fireman in passenger operations? A. Most operations have firemen, are required to have firemen. I don't know the statutory requirement, but the collective bargaining agreements require firemen in all operations throughout the United States except in certain limited operations where they use in commutation service, for example, multiple electric trains which operate with a motorman alone, and in similar bud car operations.

Judge Van Oosterhout: This passenger schedule is not based on any exposure factor?

A. No, it is not. This is just an aggregate showing.

Q. Was there any direct effect of Public Law 88108 or

Arbitration Award 282 on passenger service? A. None that I know of.

Q. Does that conclude your comments on Intervenors' Exhibit 59? A. I think I should call attention to the fact that there has also been a decline in employee casualties, that is, employee casualties in passenger operations. It is shown in a part of the table at the bottom of the page. Not, of course, as great a decline as was true for the number of passengers.

Q. I now hand the Clerk copies of Intervenors' Exhibit 60 [725] entitled "Casualties to Employees in Freight and Yard Operations", et cetera, 1961 to 1965. What is the purpose of this document, Mr. Homer? A. This document brings before the Board the actual number of casualties to employees in freight operations for these same periods. These are the casualties to all classes of employees on all railroads which involve freight trains, yard switching operations, or any other kinds of trains, other that is than passenger trains.

Q. All right. A. It will be noted that the number of accidents increased, or casualties increased from 1961 to 192, and then to 1963. The three year average was about 10,000. There was a very substantial jump in 1964 to 10,931, and then a decline from 1964 in 1965 of about 300 odd accidents, a level of 10,601. During this period there has been a substantial decline in the number of employees engaged in freight and yard operations. I am speaking now of operating employees. These casualties refer, however, to total employees. I think these particular data are of some interest in relation to Plaintiffs' Exhibit 114, which I would like to again point to, if I may.

Q. Go ahead. A. Plaintiffs' Exhibit 114 I notice that the 1965 figures are taken from advance work sheets prepared by the [726] Commission. Now, I have had no opportunity to verify these figures. I have no reason to believe that Mr. Greer or his associates would have taken

anything other than exact figures. I do believe, however, that there may be in those preliminary work sheets some inaccuracies, particularly in the relationship between the 1964 figures and the 1965 figures insofar as they relate to freight and yard service operations. I point to my Exhibit 60. It will be noted that between 1964 and 1965 there was a decline of 330 casualties between those two years. Now, these casualties covered all classes of employees who would be affected by train operations. That would primarily be train and engine service employees, of course. I have eliminated from the figures on Exhibit 114 the employees in passenger operations to see what the change was in the number of casualties on this exhibit for freight and yard service, which would relate to the decline of 330 that I just spoke of as showing on Exhibit 60. There was in that period, according to Exhibit 114 which relates to Class 1 railroads only, a decline in casualties of 467, a larger figure in this more limited area than the number, or the amount of the decline for all carriers as reported to the Congress of the United States by the Interstate Commerce Commission. Now, I [727] don't want to suggest that that is a perfect figure, because there are other classes included in Exhibit 60 that aren't included in Exhibit 114. I point also to the fact that if you go with a previous year's change, going from 1963 to 1964 there were 365 decline in total casualties for all railroads as compared to only 310 as shown for the comparable classes on Exhibit 114.

Q. All right, Mr. Homer. Have you made any studies of situations in which the decline in the size of the crew itself reduced the number exposed to casualties? A. I have.

Q. I hand the Clerk Intervenors' Exhibit 61 entitled "Change in Casualties to Train and Engine Service Employees Due to Selected Causes", et cetera, 1964 to 1966, and ask you, Mr. Homer, to explain that chart to us,

please. A. As my previous statistics have shown, there has been a very sharp increase in the number of collisions and the collision rate, but the number of casualties in collisions has declined. The employees most exposed to collisions normally are the engine service employees, and since the firemen have been removed from operations in both freight and yard service in a substantial extent, there are fewer firemen exposed to this casualty. We are [728] having more collisions, but fewer firemen are being injured because there are fewer firemen present. I should say fewer enginemen are being injured because of the taking off of the firemen. So that in itself explains some part of the decline in casualties of indiviuals. Firemen and enginemen, of course, are the employees who operate locomotives and rail motor cars. Removal of firemen has also resulted in a sharp decline in those casualties, 353, 290 and the 274. I have shown the figures for the first six months of the three years, 1964, 1965 and 1966, and for the years 1964 and 1965. Of course, getting on and off locomotives and cars is also an important cause of casualties, and the reduction in the number of employees working in these operations has had the effect of causing a decline also in those casualties—not quite as sharp a decline as was true in the other categories shown.

Q. On this exhibit you have under Train Service Accident casualties two sub-headings you have just described. Are those necessarily confined to the train crew or the train service crew? Train service in this sense does not have anything to do with the train crew as distinguished from the engine crew? A. No, it includes both train and engine crews in this case. I want to make it clear that these figures are only [729] for train and engine service employees. They wouldn't involve any other individuals or employees getting on and off engines, locomotives and cars.

Q. I see where my problem is. There is the term train

service is used in two different ways. One in the sense of the ICC category train accidents, train service accidents and non-train accidents, and secondly, as used in the heading of this exhibit, train service in the sense of the train crew as distinguished from the engine crew. Correct? A. That is right.

Q. And where you use train service to describe the two right-hand columns you are talking about train service as distinguished from train accidents? A. That is right.

Q. Thank you. Whereas train service up in the top heading means train crew personnel? A. That is distinguished from train crew rather than engine crew.

Q. The next document which you have prepared, Mr. Homer, I have marked as Intervenors' Exhibit 62 entitled "Train Accidents, Arkansas and All Other States". I think it substantially duplicates, as I recall the figures submitted by the railroad, and I don't know that any additional [730] explanation is necessary, except perhaps the average which you have produced in the center of that chart. Have you examined the railroad material in this connection? A. Yes, I have.

Q. Is there any difference in this from what they submitted? A. No, they are exactly the same figures. All I have done is to include the year 1961 and to insert the average.

Q. Have you made a comparison between Arkansas and the rest of the country in terms of casualties in rail-highway grade crossing accidents? A. Yes, I have.

Q. I hand the Clerk what I have marked as Intervenors' Exhibit 63, which is described in a document headed in approximately that way. Were the 1961 figures available for this document, Mr. Homer? A. No, they are not. They are not reported on the same basis.

Q. And what does Intervenors' Exhibit 63 show? A. Plaintiffs' Exhibit 109 did not include casualties in rail-highway grade crossing accidents. I prepared an exhibit

which would show the Arkansas versus all other states experience in this respect. It shows with reference to the two year average the 1965 record in Arkansas of 91 such casualties as 10.8% below the average of the preceding period, whereas in other states the comparable [731] figure was 15.6% above the average of the earlier years.

Q. This is important enough that I think it might be worthwhile going into detail and telling why 1961 is not available, on the same basis, or whatever you said. A. The state's data for 1961 included any non-train casualties resulting from these accidents. Now, there wouldn't be a significant number of non-train accidents, but the Interstate Commerce Commission did include such accidents. There might be, for example, accidents involving rail motor cars which would collide with—operated by maintenance of way employees—which would collide with trucks or motor vehicles. Those would have been included in the 1961 figures, but they wouldn't have been strictly comparable to these, so I did not include them. It was impossible for the later years to include them in such earlier figures.

Q. So as to all periods in which the figures are available on a comparable basis during both years, including portions of the time when the Award was in effect and the engine crew was reduced in other states, during both years in Arkansas there was a decrease over the previous average and during both years in other states there was an increase over the previous average? A. That is correct. [732] Q. That concludes the casualty data. Have you in addition, Mr. Homer, selected certain operating statistics involving railroad operations? A. I have.

Q. I hand the Clerk now three copies of Intervenors' Exhibit 64, which is entitled "Selected Operating Statistics." Would you turn to page 1, Mr. Homer. I don't think it is the page but it is the first page after the title page. Would you take each one of the four things which

you have selected involving operating averages and tell us first why did you select them? A. Well, these particular factors, particularly those in the first three columns, would be related very directly to the job which is performed by the train and engine crews. The first shows the average speed in miles per hour, the second the average length of the train in cars per train, and the third the gross tons per train. The only purpose of including revenue ton miles was to indicate the fact that the freight carried in addition to the weight of the equipment also increase during these periods. Looking first at the miles per hour, there has been a steady increase in average railroad speeds through most years. Although there was some slowdown during the war [733] period. Since the end of the war there has been an almost inexorable increase in speed year by year, with a very few exceptions. In 1964 and 1965 there was a brief resting of that upward trend, but not a very substantial one. In terms of freight train car miles, the average length of freight cars has also increased, freight trains has also increased, during most of this period. Since 1958, however, there has been little or no change in the length of freight trains. In terms of gross ton miles, however, there has been a continuing upward trend throughout this whole period, including the latest two years. The revenue ton miles, of course, are more generally a function of railroad business rather than just of operations. They fluctuate with the fortunes of the railroads and the business cycle, and currently, of course, they are at a very high level.

Q. 186% higher than they were in 1921. Is that correct? A. That is correct. And if I am not mistaken, the number in 1965 was among the highest levels in history, was in terms of the ton miles per train miles, and the number in the aggregate was close to the record level of all times. The 1966 figures are not shown here, but the aggregate number of ton miles carried by the railroads set a new all-time record in 1966.

[734] Q. In 1966? A. Yes. These figures are not, of course, shown.

Q. Am I correct in thinking that the gross ton miles column relates both to the exposure discussion which we have been having in the course of this trial, and to safety factors itself? Or is that not correct? A. Well, I think it is best said this way, that the increase in the weight of trains introduces an element that may have an effect in increasing the number of accidents. There is a greater wear and tear on the track, and a greater wear and tear on the equipment with heavier loading can be a factor causing breakdowns in the course of running over the roads in the long runs. But it is not an index of the exposure of either trains or of individuals.

Q. Would the weight of trains have any effect, for example, going back to that accident category of failure to set a sufficient number of brakes. Does that have any relation to that? A. I think perhaps the number of cars would be more closely related in that respect. Although, of course, the weight per car would be an element in determining the need for setting sufficient number of brakes.

Q. Would the number of cars be shown by the second set of [735] columns on this page? A. Yes.

Q. I don't think of many trains going 20 miles an hour. Does this refer to yard service or freight and yard service? A. No, this covers only freight service, but it is a combination of local freight, which has a great deal of switching on roads, and through freight. Through freight operations are very substantially faster than this, but we have no figures quite comparable to these for through freight operations.

Q. Would this include all the time from terminal to terminal that is, stops for inspections or breakdowns or things of that kind? A. Yes, every bit of time elapsed between the run from terminal to terminal.

Q. Now to go to the next page of Intervenors' Exhibit 64, entitled motor vehicle registration in the United States

and Arkansas. What is the purpose of this document, Mr. Homer? A. To put before the Court only the general information reflecting the fact that motor vehicle traffic on the highways has grown spectacularly in the last thirty odd years, and this has been true both in the United States and in Arkansas. It has a two-way relationship to [736] safety. First of all it poses an increasing hazard for the members of the train crew. And, of course, it affects the exposure of the general public to the possibility of grade crossing accidents, a greater number of people traveling on the road.

Q. Now, in the railroad presentation in this case there was a suggestion that the fact that train accidents, ICC statistics were going up were due to inflationary factors as to wage increases and increases in cost of equipment and so on. Have you made any computations in relation to that kind of issue, Mr. Homer? A. I have.

Q. I now submit Intervenors' Exhibit 65, which is entitled changes in unit wage costs and prices of railroad materials and supplies. And ask first, as to page 1 entitled Revision to Interstate Commerce Commission Standard et cetera. Would you explain to us briefly this chart, Mr. Homer? A. During the period from 1939 to 1955 the Interstate Commerce Commission made periodic revisions in the minimum damage standard for determining reportable train accidents. In 1939 it was $150. In 1948 it rose to $250 by action of the Commission, and then in successive years it was increased as shown in the figures in the first column on the left. I have computed an index of that change over that period [737] from 1939. The material and supplies purchased by the railroads are published, the index of the prices are such materials and supplies are published by the Association of American Railroads over the period from 1939. There are no earlier figures. And I have reproduced those Association of American Railroads' figures in the third column, and an index of such figures in the fourth column. And throughout the period

covered there has been a rough agreement in the increase in the charge of prices of railroad materials and supplies and the revisions which the ICC made in its standard for reportable train accidents. Over the whole period the ICC standard increased from $150 to $375, an increase of 150% on an index showing of 250%. During that same overall period the charge out prices of railroad materials and supplies increased 148%, or to an index of 248.9. Thus, there is a rough comparability during that period. At the time of the revision in the accident statistics in 1957, the Commission raised that standard from $375 arbitrarily to $750 without reference to any such index of materials and supplies. As I stated before, in 1960 when a later revision was made in the statistics, this was a debated question, and one that was not, in my opinion, resolved satisfactorily. The employee representatives on that Commission tried to have the [738] $750 standard set on a more reasonable basis to realities of changes in materials and supplies, and changes in costs. Four years, of course, had elapsed since the change in the figures, and nevertheless there would not have been hundred per cent increase in the standard required by any figures that we could assemble. Nevertheless neither the railroad nor the Interstate Commerce Commission were agreeable to, in effect, throwing that standard back to the preceding basis. It has remained fixed since 1955. There has been some increases in materials and supplies since that time, but nothing like the hundred per cent that the 1957 change brought about.

Q. Let me interrupt you. You said it had remained fixed since 1955? A. 1957.

Q. 1957? A. Yes.

Q. All right. That 1957 change is not shown on this chart? A. That is correct.

Q. All right. What does charge out prices mean in the sense of this chart? A. Well, those are, as I understand it, the price that the railroad carriers charge on their

books for materials and supplies that they purchase for all purposes. It [739] excludes, of course, fuel.

Q. And you go further into charge-out prices on page 2 of the exhibit. Is that correct, Mr. Homer? A. Yes, I thought it would be of interest to see how these prices of materials and supplies have changed during the four years, 1961 through 1964, this is the only period for which I have these Association of American Railroad figures. And it will be noted that there has been virtually no change in this index from 1961 through 1964.

Q. What does the term material and supplies encompass as it is used in this respect? A. Well, it includes every type of supplies—ties, rails, parts of locomotives and freight cars. Anything else that is used by the railroads in their operations or in their business.

Q. Does it include rolling stock? Locomotives and things like that? A. It would not include new elements of equipment.

Q. Would you turn then to page 3 of the exhibit, Change in Wage Costs from 1961 to 1965, and explain that to us, please, Mr. Homer. A. Exhibit 114, the change in wage rates was shown on page 3 for maintenance of way and maintenance of equipment forces——

Q. You are referring to Plaintiffs' Exhibit 114? [740] A. Plaintiffs' Exhibit 114.

Q. Is it 114 or 109? A. I am sorry. It is 109.—In Intervenors' Exhibit 65 I have on page 3 derived the wage costs of all employees in terms of the cost per thousand train miles and in terms of the cost per thousand car miles. These are unit costs of wages paid for employees. I think the more significant figures are on page 4, where these unit costs have been developed for maintenance of way employees and maintenance of equipment employees. There were during this period increases in rates of pay for both classes of employees. I think we brought out in the record yesterday, there were some increases, additional increases becoming effective in 1967.

These, however, are the latest figures that can be assembled on a yearly basis covering these costs. It will be noted that as in the case of materials and supplies the unit costs in terms of the cost per thousand car miles and per thousand train miles have not changed very greatly.

Judge Henley: Mr. Youngdahl, what is the significance in this lawsuit of the unit costs of these maintenance of way and maintenance of equipment employees?

Mr. Youngdahl: As I understand it, Your Honor, the [741] entire crux of the railroad's presentation in this area is to try to explain away the sharp increase in train accidents during the period. Now, one of the things they are doing, or attempting to do by such things as the increase in pay statistics in Plaintiffs' Exhibit 109 is to show that reportable train accidents, accidents are becoming more reportable because the costs are becoming more inflated. And this explains why the figures show that there are so many more accidents.

Judge Henley: Well, doesn't this theory relate, however, to the cost of each accident?

Mr. Youngdahl: Yes, sir.

Judge Henley: Rather than the cost per mile?

Mr. Youngdahl: Well, I don't know how you would determine a unit cost from figures available to us, at least, outside of this way.

Judge Henley: All right, go ahead.

Q. Do you know any statistical manner using figures available to us, Mr. Homer, in which, or by which unit costs relating to that accident figure of $750 can be determined other than what you have done here? A. No figures in any way that would shed more light on these particular facts, no, sir.

Q. On page 4 of Plaintiffs' Exhibit 65 appear to show that [742] the wage costs per thousand car miles has declined, or at least is a little under what it was at the beginning of the period shown on the graph. How could that be in view of the fact that the wage rate per hour of

employees has increased? A. Well, the railroads, of course, are introducing many improvements in their technique for maintenance and the employees are becoming more productive or more efficient in this respect, and the number of employees required to do any number of maintenance jobs is becoming smaller year by year, which is compensating for the fact for the increases in wage rates and holding the actual unit cost of operation down very substantially.

Q. Mr. Homer, summarizing the material presented by you up to date, that is the material concerning railroad accident experience, especially experienced since May, 1964, and in light of historical perspectives, what are your conclusions from a statistical point of view and economic point of view as to this subject? A. Those accidents first which would seem to be related to the question of crew consist and presence or absence of the firemen, collisions has certainly increased, and increased in a very approximate relationship to removal of employees in freight and yard service. Other [743] accidents have also increased due only in part to such causes, due in part, of course, to other causes. Casualties rose very significantly with the immediate effect of Public Law 88,108, and Arbitration Award 282, but with the removal of a considerable number of employees from service the number of casualties did not continue to rise because of the drop in exposure of such employees. As a statistician I would conclude that there is some relationship—and I certainly wouldn't define it authoritatively with any degree of precision—there was some relationship between the removal of firemen and other crew members after the effect of Arbitration Award 282 and the accident record of the railroads since that time.

* * * *

[744] Q. Mr. Homer, I want to go to an entirely different field now, without any direct relationship to the accident statistics we have been discussing, and that is the area

of cost of compliance with the Arkansas Full-Crew Statute. First of all, from an economist's point of view, how should cost of compliance be computed? A. A correct computation of the cost of compliance, Mr. Youngdahl, should compute the total operating costs on some unit basis, preferably per mile operated, before the change has taken place, and relate them to some kind of pro forma estimates of the total costs after the change is to be consummated. Now this would require, of course, some estimates of the effect, but it would include in addition to the change in the crew consist to reduction in forces in the number of employees and their wages would include, of course, some offsets that would have to be taken into account to get a true relationship between the two periods.

Q. Now, in my terminology, would it simply be picking out what it costs now and subtracting from that total the [745] things that it would cost as offsetting items if the crew were reduced and the statutes were removed? A. As well as such elements could be determined in a pro forma advanced computation.

Q. Have you examined Plaintiffs' Exhibits 43, 81, 85, 86 and 88, and the accompanying Intervenors' Rebuttal Exhibits which deal with the cost of compliance presentation of the railroad for each of the five plaintiffs? A. I have.

Q. Have those documents, have the railroads' presentation been consistent with the formula for determining cost of compliance that you have just given us? A. None of them did.

Q. What has been the deficiencies in general, Mr. Homer? A. All of the plaintiffs computed really only the cost of wages they were now paying to the individuals they expected to take out of service. None of them gave any consideration whatever to any of the offsetting elements.

Q. Did any of the railroads in these presentations furnish data from which you could make an estimate of the

real cost of compliance and include such offsetting elements? A. One railroad, the Kansas City Southern, gave information which would enable me to make such a general computation, but covering the wage cost only, Mr. Youngdahl. None [746] of the more general offsets which could conceivably result from an increase in accidents, for example—

Q. Perhaps you had better go down the list. What are specifically some of those offsets? A. Well, the general offsets would certainly include the cost of increasing accidents to the tracks and to the equipment, the cost of clearing wrecks, the possible cost of personal injury and insurance costs, the damage, increased damage to freight that might result. Any increased operating cost resulting from a rise in equipment and maintenance problems. For example, the presence of a fireman on a locomotive can affect the degree to which a locomotive can be kept in service on the road in the answering of alarms and correcting defects of that kind out on the road. As the figures show, there has been a very significant increase in the last two years in the percentage of defective locomotives. Now the extent to which that is due to the absence of firemen, I can't say. But that is another type of element that could affect and be an offset to any change in the wages.

Q. Now, those that you have just given us—Go ahead. Did you have something more? A. That is just a partial list. In addition, there is, of course, if it is necessary to operate at slower speeds [747] there could be a drop in efficiency of operations. The standard efficiency factor, gross ton miles per train hour might drop. It would be a more abstruse factor, but it would be present. Now, in addition to those, of course, there are those directly related to the employment costs.

Q. Let me interrupt now. The list that you have just given us prior to employment costs do not involve the compensation of a crew directly as such? A. No, they do not.

Q. Now, are you proceeding to offsetting factors which involve the compensation of the engine crew and the train crew? A. I shall try to do so. For one thing, I think that the very cost that would be incurred by carriers taking out of service these crew members in complying with Award 282 providing the severance allowances and other allowances that the Award in its terms set up for such individuals. However, there are also possible offsets in the wage costs themselves, higher wage costs may result for the remaining crew members because of certain circumstances. Operating conditions, there may be increased delay time, increased time for switching, reduction in operating speeds, an increase in the time on duty of employees because of that fact, perhaps more unscheduled stops, particularly [748] in light of the fact that without a fireman present to go back and answer alarms, it may be necessary to stop the train. Elements of that kind, of course, would affect the overtime of the remaining employees, would affect to some extent the constructive allowances which are paid the employees.

Q. What does that mean? A. Constructive allowances are the arbitrary amounts and extra amounts that are paid under the due pay system. The due pay system is a mileage system. When the mileage system applies generally when the train operates faster than a given standard speed, which is twelve and one-half miles per hour in freight service. When elements interfere in any way with the full efficiency of operation the railroad pays for, say, delay time to crew members. That is a type of constructive allowance. Terminal delays, both at the initial and final terminal, the operation of the conversion rule when there are certain types of delays, running over the road. These are technical terms, I understand.

Q. A few of them I would like to have—— A. The conversion rule provides that under certain circumstances where there have been switching interruptions to the run over the road, the through freight man who normally

lower rate of pay than the local freight man, will be paid the [749] local freight rate, for an engineer that is fifty-six cents a day higher. Just one of the elements. Of course, there is some specific items, special pay that is given to engineers when they have to operate without firemen. All of these elements, and possibly some others that I haven't tried to enumerate would affect the pay of the employees still on duty.

Q. Do I understand it then that if a particular freight train operation takes a longer period of time to operate, that the hours that are extended are hours that require a greater per hour compensation to employees than the earlier hours on that run. Does that tend to be true? A. That can be true. It will depend, of course, on many circumstances.

Q. Well, does it have to pass a certain point before that kind of progressive increase in compensation kicks in? A. Well, yes. For example, say the final terminal delay extra payment doesn't begin until after there has been a thirty minute delay, and then it applies after that period. Overtime doesn't normally apply except to the extent to which speeds fall below 12½ miles per hour. Various other allowances come into play on varying standards.

Q. Has any single one of these offsetting matters, either [750] the general matters or the matters relating to employee compensation themselves, been taken into account in any of the five railroads presentations about cost of compliance here? A. No, they have not directly. But as I said, the Kansas City Southern did include in its presentation a very comprehensive computation of its estimated cost, which gave basic figures from which some estimate of that character could be made.

Q. Well, that was Plaintiffs' Exhibit 86, Mr. Farrar's statement and the cross-examination of Mr. Vollrath? A. That is correct.

Q. Now, insofar as the conclusions of Mr. Farrar about the cost of compliance for Kansas City Southern, did his

conclusions and the final ultimate figures that he reached for cost of compliance, did they include any of these offsetting factors including either general factors or compensation factors? A. No, they did not.

Q. What did he include with his exhibit that distinguished it from those presentations of the other four railroads? A. Mr. Farrar included first in all of his computations the number of miles actually operated in the State of Arkansas. Among some of the other plaintiffs this information was [751] furnished. It wasn't made completely clear that these were Arkansas operations in the sense that Mr. Vollrath affirmed that fact for the Kansas City Southern figure. More important, however, the Kansas City Southern also furnished information of the exact amount of money paid to employees in Arkansas for such operations. No other carrier gave that information.

Q. Have you based upon the detailed data furnished by Mr. Farrar and confirmed by Mr. Vollrath in his deposition, have you made some computations as to the cost of compliance for Kansas City Southern, taking into account the offsetting factors in regard to employee compensation? A. I have taken the Vollrath and Farrar figures for the Kansas City Southern and related them to the figures for the Kansas City system as a whole, exactly comparable figures. Now the Kansas City Southern figures as a whole would include compensation figures would include any offsets that resulted from these elements I have spoken of.

Q. I hand the Clerk copies of Intervenors' Exhibit 66, which is entitled Statistical Tables related to testimony of Witness D. E. Farrar, Kansas City Southern Railway. I would like, Mr. Homer, for you to explain these charts in some detail, if you please. Turning to page 1 would you please explain that chart to us. [752] A. On page 1 I have taken the compensation that was paid to the enginemen—now this is the engineer and the fireman to-

gether in the State of Arkansas as shown in Mr. Farrar's exhibit. That expense is shown for each year in the first column, shown for the four years 1962, 1963, 1964, and 1965. Those were the only complete years for which this information was furnished by Mr. Farrar. He did give some six months figures for 1966. I have also taken the freight train miles which were submitted by Mr. Farrar which apply to the operations for which this engineman wage expense was paid. It is testified to very directly by Mr. Vollrath.

Q. In Arkansas? A. In the State of Arkansas.

Q. And from the combination of those two figures you have been able to compute a per mile Arkansas engineman cost. Is that correct? A. Yes. In the last column we have got the engineman cost per mile operated in the State of Arkansas. Now the first of those figures was actually affirmed by Mr. Vollrath in a computation made in his, process of his cross-examination. The rest have been supplied and checked following exactly the same method that Mr. Vollrath used.

[753] Q. In the, that is the confirmation confirmed that it was the actual miles operated in Arkansas as distinguished from some estimate or projection? A. Yes, and the actual expense incurred in those operations.

Q. And that shows, I guess the trend is of no special significance in that respect, is it, Mr. Homer? A. Taken by itself it is surprising that the trend did not rise somewhat more than is shown here. There was an actual drop in 1965, although there were wage increases during this period. I can't explain why it did not rise more than it did. But at any rate, this engineman expense per mile rose during the early period and rose very significantly in 1964, and then dropped back in 1965.

Q. Now, engineman expense in this sense includes, I assume, both the engineer and the fireman? A. Engineer and fireman. I think it should be pointed out that it is in freight service only.

Q. Account 392, what does that mean? It is up in the title of this page. A. That is the Interstate Commerce Commission account in which these expenses are reported, both in the country as a whole and in their report in Arkansas.

Q. Well, was that term used in Mr. Farrar or the Kansas City Southern presentation? [754] A. I believe it was not used, but the source of reference used by Mr. Farrar was to the Arkansas amount reported in that account.

Q. Now, we proceed to table 2 in this document. Is this a comparable computation for the train crew? A. Yes, it is. It includes brakemen and conductors.

Q. Were the figures about trainmen expense and freight train miles; are they the actual expense and the actual miles directly attributable to Arkansas operations of the Kansas City Southern? A. Yes, they were, according to Mr. Farrar and Mr. Vollrath.

Q. And you have thereby reached the expense per mile figure shown in the column on the right. Now that is substantially higher than the enginemen expense per mile. I assume that that reflects ~~that~~ the train crew is larger than the engine crew? A. Yes.

Q. That would include in freight service, conductors and the brakemen required by the Arkansas law? A. That is correct.

Q. Is there anymore about that chart that is of significance? A. No. A very similar trend, however, is that shown for the enginemen.

Q. Now will you turn to page 3, please, and tell us what [755] that page represents. A. On page 3 I have brought together the same type of figures covering the entire Kansas City Southern system, going to the same accounts for enginemen and trainmen and taken their reported freight train miles from the Interstate Commerce Commission system report comparable to the Arkansas report used by Mr. Farrar. And I have computed the wage costs in exactly the same manner.

Q. All of the source material which led to the table on page 3 came from ICC official reports. I take it none of those relied on the Kansas City Southern exhibits in this case. A. No, that is correct. The Kansas City Southern report to the Interstate Commerce Commission.

Q. Yes. And the figures represent the systems in all states, including Arkansas? A. Including Arkansas.

Q. Now then, have you compared the Arkansas cost per mile with the cost per mile in the system as a whole based upon Mr.—the Kansas City Southern's submission and reports furnished through ICC? A. That comparison is made on page 4 of the exhibit showing the cost for freight train mile for Arkansas as taken from Mr. Farrar's materials, and for the system as taken from the report to the Interstate Commerce Commission.

[756] As for enginemen, it is noted that the cost of, in 1962 of Arkansas enginemen cost, the system cost, was in a ratio of about 11.9% higher. In other words, the Arkansas costs were that much higher than the system costs. Of course, the costs of employees will vary as the result of a number of variables, and that could explain this basic difference. The remarkable thing about these figures is that although Arkansas retained a fireman in all of its freight operations throughout this period, in the system as a whole there was a reduction in the crew, and one would have expected to see ~~a rise~~ in the relationship of Arkansas to the system. We would have expected that the Arkansas ratio to rise above 1.119 and 1.066. There is very little change in the relationship considering the fact that many firemen were taken off on the Kansas City Southern in other states. The 1965 figure 1.08 is actually below 1962 and only a little above 1963.

Q. Now, let me see if I understand this. On the four years in question on page 4—1962 to 1965—were the only full four years from which Mr. Farrar and his associates produced data. Is that correct? A. That is correct.

Q. And 1962 and 1963 were, of course, two years in which

there were comparable crews or ratio was already established [757] before the firemen were dropped off and subsequently crewmen were dropped off in other states? A. That is right.

Q. Beginning in 1964 and 1965 the crews in other states have gone down; in Arkansas they have stayed the same? And there hasn't been any change in the ratio between Arkansas to other states? A. Such changes as has occurred is that represented on page 4, Mr. Youngdahl, and it actually shows a drop from 1964 to 1965, and 1965 is below 1962.

Q. How can this be explained, Mr. Homer? A. Well, I can't explain it, of course, in detail, because I don't have a breakdown of the payroll figures, but the elements that I spoke of before——

Q. That is those compensating factors generally and the specific factors relating to compensation of employees due to delay and due to the extra expense. Is that correct? A. Yes.

Q. What then does page 5 add to this sequence? A. Perhaps I should comment on the relationship of trainmen. The remarkable thing in the trainmen relationship is that there is throughout the period very little difference between Arkansas and the system. Although three trainmen [758] are required in Arkansas, and in most other states they have used two, and have dropped down even below that during the post-arbitration period.

Q. Depending on particular findings of particular boards? A. Particular Boards of Adjustment under the Award.

Q. Beginning in 1964 and continuing through 1965? A. Yes.

Q. You are still then at the bottom part of page 4. A. Yes.

Q. Has there been any trend shown as to the relationship between the, the ratio between Arkansas per mile cost and system per mile cost on the trainmen portion of

the crew? A. Yes, there has been a little increase to be noted from a ratio of where they were about the same in 1962, exactly the same, to the place where in 1964 they were just under 3% higher in Arkansas than in the system, and in 1965 1.4% higher.

Q. Now, what do pages 5 and 6 add to this series of computations? A. Well, on pages 5 and 6 I have simply reproduced the raw figures of operating expense for enginemen and brakemen relating the Arkansas total to the system total, and it is quite apparent from these figures that there has been no significant change. Arkansas in 1962 took 24.7% of [759] the compensation paid enginemen, and 23% in 1965. On page 6 the same fact stands out for brakemen, practically no change in this relationship.

Q. What do the data on page 4 add to the data—excuse me. What is added by the data on pages 5 and 6 to the computations on page 4? A. Pages 5 and 6 are done only in terms in the aggregate amounts of money spent, whereas the earlier pages reflect the unit cost per train mile of operation.

Q. In determining cost of compliance and the effect of invalidation of the Arkansas Statutes, which table, in your view is the most significant in this exhibit? A. I think that the first four pages are by all odds the most significant.

Q. In the light of the material in these tables from a statistical and economic point of view, Mr. Hômer, do the plaintiffs' material on cost of compliance give any, to what extent do they give an idea of what the true picture is as to cost of compliance? A. Well, if the Kansas City Southern data are accurate, and, of course, I have no basis for disputing their accuracy or the statements of Mr. Farrar and Mr. Vollrath as to the significance, one must conclude that the removal of firemen, and to some extent brakemen in Arkansas [760] is not likely to change the

overall relative level of costs from what it is in the rest of the system.

Q. Is there available to you through published or reachable figures the amount of freight train miles operated in Arkansas and the cost of particular crewmen on those miles for any railroad other than Kansas City Southern because of what Mr. Farrar and Mr. Vollrath presented? A. Such data may be reported, Mr. Youngdahl, to the Arkansas Commerce Commission. I have not checked. But they were reported to that Commission by the Kansas City Southern Railroad. I would have no way of knowing for such other railroads, however, whether such information were actually representative of operations in the state as distinguished from their having been allocated on some arbitrary basis I don't know, of course, that these figures—wouldn't know that these figures were not just arbitrarily allocated had it not been for the fact that Mr. Farrar's use of them in his original presentation was such that the technique would have been meaningless in his whole computation had they not been representative of actual operation and had not that fact been ascertained and affirmed in the cross-examination of Mr. Vollrath.

Q. A couple more minor matters or final matters at least, Mr. Homer. Did you prepare certain excerpts from the [761] hearing before the Committee on Commerce of the United States Senate in the post-Arbitration Award 282 examination by that committee? A. Yes, I did.

Q. And what—do you have a copy of it there? A. I see I do not. I have, however, the original.

Q. What do these excerpts which I now hand to the Clerk marked Intervenors' Exhibit 67 reveal just generally, Mr. Homer? A. Well, in Plaintiffs' Exhibit 79, I believe it was, on page 64, there are some findings made on the subject of railroad safety which were related to the letter written by the Chairman of the Interstate Commerce Commission on June 11, 1965, to the

Chairman of the Senate Committee on Commerce relating to the affect on safety of the removal of firemen. That letter is reproduced on page 2 of this exhibit. And there is a further reference in the statement in Plaintiffs' Exhibit 79 to testimony of Mr. John W. Bush before the Senate Commerce Commission. The statement on page 64 of Plaintiffs' Exhibit 79 is reproduced on page 1 of this document, Exhibit 67. Then the full letter of the Chairman of the ICC and the testimony of Mr. Bush with reference to that, including the cross-examination with reference to the statement included in Exhibit 79, has been reproduced.

[762] Q. Without going through the process here I think I can just ask you, have you made certain marks on that reproduction which indicate what you feel is especially important to the issues that you just pointed out? A. Yes, I have made certain emphasis marks on these pages to direct attention to the part of Mr. Bush's testimony where he discusses the accidents described on page 64 of Plaintiffs' Exhibit 79, and specifically where he in effect repudiates the statement that was relied on in Plaintiffs' Exhibit 79. I call attention to the fact that this statement by Mr. Bush was made on August 30, 1965, and the statement which is included in Plaintiffs' Exhibit 79 was made on January 5, 1966, five months afterwards, almost five months afterwards.

Q. What is the date of the testimony before the Senate Committee, approximately? A. It was, the letter was dated June 11, 1965, the statement August 30, 1965, the——

Q. Do you recall if December, 1965 was the testimony that you have extracted? A. That is correct.

Q. One more matter that was brought to my attention, if the Court please, during the break that some of my questions might have suggested that the railroad did not in fact [763] furnish us copies with the material to be submitted with Mr. Greer's testimony. In fact, such

copies were submitted last week, a set was sent directly to Mr. Homer, and we have had them available for several days. That concludes my examination of Mr. Homer.

Cross-Examination,

By Mr. Lucente:

Q. Mr. Homer, you testified in response to a question by Mr. Youngdahl with respect to your prior experience. You have been a consultant for railroad labor organizations since the 1930's. Is that correct? A. Since 1936.

Q. Does your experience include any experience in the operation of trains? A. No, it did not.

Q. Does it include any experience as an employee involved in the operation of trains? A. No.

Q. Have you ever been in the position to be responsible for the operation of trains? A. No, I have not.

Q. Isn't it a fact that what you know about train operations come from your conversations with your clients, isn't it, Mr. Homer? [764] A. Yes, over a thirty year period my continuing association with the industry.

Q. Your association with the industry hasn't involved any extended periods of observation or train operations or anything of that nature, has it, Mr. Homer? A. Well, it has involved a considerable number of observations of train operations, yes.

Q. Under what circumstances? A. Under circumstances, well, for example, most recently, a year or so ago, I had to testify for the Interstate Commerce Commission in connection with the extended draw-bar proceedings. It was necessary for me to go out into the railroad yards to find out what elements about the extended draw bar constituted a hazard for employees. And, of course, I have been through railroad shops, I have looked over railroad equipment, I have worked with railroad operating people for many years.

Q. You mean the representatives of the unions that

you have represented? A. Well, of course, most of my contacts have been with union representatives.

Q. You appeared as a witness before the Presidential Railroad Commission, did you not? A. Yes, I did.

[765] Q. You presented statistical details to that Commission, did you not? A. Yes, primarily historical details in the era of safety, area of safety.

Q. Wasn't it the purpose of your presentation to convince the Commission that firemen should be used on all locomotives in all classes of service? A. The purpose of my testimony there, Mr. Lucente, was to present the historical facts on train operation. At that time there was no experience with or without firemen on which I could rely.

Q. Didn't you present detail on railroad accidents that had occurred in the past for the purpose of suggesting that accidents occurring in railroad operations were such that the continued presence of the fireman was necessary? A. What I really testified to, Mr. Lucente, was that operations in steam era were not essentially different from operations in the diesel era insofar as the safety element was concerned.

Q. That the fireman being needed on the steam operations was also needed on diesel operations. Is that right? A. That conclusion may have been drawn from my testimony.

Q. What was the ruling of the Presidential Railroad Commission with respect to continued employment of firemen in freight [766] and yard service?

Mr. Youngdahl: I object, Your Honor. In the first place, under any circumstance, the matter is in the record repeatedly. Secondly, we object for the reason that we stated concerning other awards, bodies and commissions other issues decided and the issues before the Court.

Mr. Lessenberry: We join in that objection.

Judge Van Oosterhout: Maybe there is some purpose. We are all aware of what the railroad board, and I sup-

pose it is preliminary to something. It isn't introducing any new matter. Ruling reserved.

Q. Would you answer the question, Mr. Homer? A. I think it is clear that Award 282 allowed the railroads to remove firemen in most operations in freight and yard service.

Q. I was talking about the report of the Presidential Commission, but you have answered an additional question that I intended to ask. A. Well, the answer is the same in both instances.

Q. You appeared before Arbitration Board 282, didn't you? A. Yes, I did.

Q. And presented material of much the same kind that you presented to the Presidential Commission? A. To be accurate, Mr. Lucente, I did not present any extensive [767] data on railroad safety before Arbitration Award 282.

Q. Also the Labor Board of the Middle West at one time? A. Yes, sir, Mr. Oliver, my associate did deal with that subject.

Q. Did you assist Mr. Oliver in the preparation of his material? A. Oh, yes.

Q. You also appeared before the trial court in Nebraska considering the full crew law in that state, did you not, Mr. Homer? A. Yes, I did.

Q. And what was the issue in the Nebraska case. Do you recall? A. The Nebraska litigation, as I recall, involved the violation of the then existing Nebraska statute requiring full crews on locomotives.

Q. Did you present data to the Nebraska court intending to show that since the effective date of the Award of Arbitration Board 282 that there had been an increase in railroad accidents? A. I did present some very limited data that was available at that time. We had at that time, Mr. Lucente, only the very preliminary information and report in for fifty of the commissions. That was presented, however.

Q. Did the Nebraska court decide against the position of the intervenors whom you appeared on behalf of in that case, Mr. Homer?

[768] Mr. Youngdahl: We object, Your Honor.

Judge Van Oosterhout: I don't know whether we have got the Nebraska deal in the record or not. I don't believe it is a proper way to get it in the record. Is the Nebraska decision in the record in any other way?

Mr. Lucente: I do not believe the Nebraska decision is cited in any way. We will cite that in our brief.

Judge Van Oosterhout: I am inclined to sustain the objection.

Q. Mr. Homer, have you also been a consultant to the flight engineers in their labor disputes with the airlines? A. Yes, I have.

Q. And this dispute to which I refer is one centering about the question of whether or not flight engineers should continue to be used in the cockpit crew of the airlines? A. Not quite, Mr. Lucente.

Q. In any event, it involved the use of flight engineers on new types of jet planes, did it not? A. No, it didn't involve that either.

Q. Did it involve the continued use of flight engineers by the airlines at all? A. No.

Q. What did it involve? A. It involved the question of whether flight engineers who were by the CAB and the FAA required in operations, whether they needed to be qualified also as pilots in addition to [769] being qualified as flight engineers.

Q. Mr. Homer, you also appeared as a witness on behalf of the intervening labor organizations in the Wisconsin case involving the full crew law in effect in Wisconsin? A. Yes, I did.

Q. When did you appear in that litigation? A. Well, it was last summer. The proceeding went on for quite a long period, off and on. I can't recall at this moment the

exact dates on which I testified. I was on the witness stand two or three times, I recall.

Q. It was in the summer of 1966? A. 1966.

Q. Did you in the Wisconsin case appear on behalf of the same brotherhoods that you appear on behalf of in this case.

Mr. Youngdahl: I object. I can see that there is relevance to the fact that this man has been a witness for organizations taking the same position as we are taking here, but details of his associations of such organisations seems to be beyond the scope of that degree.

Mr. Lucente: I think it is important who Mr. Homer represented in Wisconsin litigation because I hope to make the comparison between the material he presented there and what he has presented here.

Judge Van Oosterhout: The ruling will be reserved.

[770] A. I was asked by the Brotherhood of Locomotive Firemen and Enginemen to appear and present material in Wisconsin.

Q. On whose behalf did you appear in this litigation?

Mr. Youngdahl: We will stipulate he is appearing on behalf of all five of the intervenors.

Mr. Lucente: Can't the witness answer the question, Your Honor.

Mr. Youngdahl: I don't think details of relationship——.

Judge Van Oosterhout: I think it is within the scope of examination to show his interest, bias or prejudice, if any, in any of those matters. You may proceed to a limited extent.

A. I was retained by the Brotherhood of Locomotive Firemen. You may say that was to appear in their behalf, in the Wisconsin litigation.

Q. I am asking you now about this litigation. A. In this proceeding?

Q. In this proceeding. A. In this proceeding I was asked by Mr. Youngdahl and his associates to work with them in preparing for this case.

Q. Do you appear here on behalf of the Brotherhood of Locomotive Engineers, Mr. Homer?

Mr. Youngdahl: I object, Your Honor.

Judge Van Oosterhout: I sustain it as to the form of the question. When you get into what his arrangements are, that might be different.

[771] Mr. Lucente: I will accept Mr. Youngdahl's stipulation, and we will pursue it on that basis.

Q. Mr. Homer, you introduced an exhibit which contains excerpts from hearings before the Senate Committee on Interstate Commerce according to your direct testimony, did you not? A. I did.

Q. You appeared as a witness before that committee, did you not? A. Yes, I did.

Q. And my reading of the record indicates that you appeared there on behalf of the Brotherhood of Locomotive Firemen and Enginemen. Is that correct? A. I did.

Q. Did the Brotherhood of Locomotive Engineers also have a representative in those hearings, Mr. Homer? A. Yes, my recollection is that Mr. Heath testified on behalf of the Brotherhood of Locomotive Engineers.

Q. You know, do you not, Mr. Homer, that a letter was received by (Strike)—Were you present when Mr. Heath testified? A. No, I was not.

Q. Are you familiar with the record of the hearings before the Senate Committee from which your excerpt was introduced, Mr. Homer?

[772] Mr. Youngdahl: Your Honor, I object to questions relating to the position of any particular organization in past proceedings on the grounds that I stated before, plus the particular ground that in the Norwood case the court considered what was presented with the evidence that one of the labor unions involved in that case, namely, the Brotherhood of Railroad Trainmen, had agreed in certain instances that a crew of less than three brakemen might be operating certain kinds of trains under certain circum-

stances in exchange for certain things, and found that to be irrelevant and immaterial to the constitution which was before the Court. On that same ground plus the additional grounds which I have stated in connection with other, we object to questioning along this line.

Mr. Lucente: May I be heard on that?

Judge Van Oosterhout: What, may I ask to start with, has this been offered in the record heretofore?

Mr. Lucente: The witness on the stand offered a voluminous excerpt from the hearing during his direct examination, Your Honor.

Mr. Youngdahl: The witness has referred to this record repeatedly. He appeared——

Judge Van Oosterhout: The ruling will be reserved.

Q. Mr. Homer, referring to page—do you have a copy of this [773] record before you. A. Yes, sir.

Q. Referring to page 7 of the hearing before the Interstate—Senate Committee on Interstate Commerce, I will ask you whether or not there starts at that page a letter written P. S. Heath, Grand Chief Engineer of the Brotherhood of Locomotive Engineers and Firemen? A. There is such a letter.

Q. What is the date of that letter? A. The date of the letter is July 2, 1965.

Q. To whom is the letter addressed? A. Honorable Warren G. Magnuson, U. S. Senate, Washington, D. C.

Q. Turning to page 8 where the letter continues, referring to the third full paragraph in the, fourth full paragraph on the page. Will you read those two paragraphs into the record? A. That is the paragraph beginning "Because"?

Q. "In this respect."

* * * *

[774] A. "In this respect keep in mind that the engineers, whom we represent, are still physically present on the railroads running trains. If any hazard exists by the ab-

sence of a fireman, it is the engineer who is most directly affected, not those firemen who have been separated from the service in accordance with the protective features of the arbitration award. Who can better judge application or misapplication of the arbitration award than the members of our organization? With this obvious investigative source at our disposal, we promptly requested our membership to observe the effects of arbitration award 282, as mirrored by their day-to-day on-the-road-experiences. It has been my belief that experience is an extremely meaningful criterion in virtually all situations, but in relation to manning or other operational changes it is practically sacrosanct. It does, however, require time and patience to compile results based on experience. In context with the changes authorized by the arbitration award, I personally saw no purpose in engaging in a series of protracted meetings before such experience studies had been conducted, let alone the results compiled. After all, the award speaks for itself. It is what has happened in its application, i. e., experience, that the national joint board is interested in."

Q. Continue with the next paragraph. [775] A. "As to the results of our experience study, the engineers report that the award as applied has not adversely affected either the employees or rail service in general. The engineer's responsibilities without a fireman are just the same as they were with one. In the absence of a fireman, the engineer may now feel it necessary to be more alert than he otherwise might have been had another member of his crew, upon whom he may have relied for some assistance, been available. In short, engineers are now efficiently and safely moving their trains over the road. An excellent illustration of the above is the experience on those few small railroads where the firemen's organization represents engineers. When given an option to accept or reject a $1.50 increase in daily rates (which my organization negotiated with the carriers) to compensate for those additional

tasks now performed by the engineer, the great majority of even these B. L. F. & E. represented engineers chose the money, which they certainly would not have done if experience indicated that the absence of a fireman exposed them to added hazards."

Q. That is all that I care about your reading. Thank you. That is a letter, you say, from P. S. Heath who at that time was Grand Chief Engineer. What is the nature of the position signified by that title—Grand Chief Engineer? [776] A. He was executive head of the organization.

Q. Is Mr. Heath still executive head of that organization? A. He is.

Q, Was he just recently re-elected to his position as executive head? A. I know he has been re-elected. I don't know just how recent it was.

Judge Van Oosterhout: Do you want to make an objection, Mr. Lessenberry?

Mr. Lessenberry: If the Court please, to clarify the objection made by Mr. Youngdahl to the entering into this area, that objections to the content of the letter, that portion of it which was read as to experience, speculation and so forth of the writer, the objection might also be directed to that area also.

Judge Van Oosterhout: Very well, the objection may extend to all references. I understand anyway there may be some matters, some legal questions raised in the brief as to the admissibility of the proceedings before the Commission and the Board, but my view is Mr. Youngdahl has through witnesses introduced some excerpts and one thing and another, so we might as well go to the reasonable extent of it, and reserve the legal questions for your briefing.

Q. Mr. Homer, Mr. Youngdahl also asked you some questions about [777] Plaintiffs' Exhibit 79, which is the Report of the Joint National Board, did he not? A. Yes.

Q. Have you examined the report of the Joint National Board? A. Yes, I have.

Q. Is that report signed by a Mr. C. J. Coughlin on behalf of the Brotherhood of Locomotive Engineers? A. It was.

Mr. Youngdahl: I just want to be absolutely sure, Your Honor, that my objection to material of this kind applies now to the reference to Plaintiffs' Exhibit.

Judge Van Oosterhout: If you want to broaden your objection or state it any way, feel free to do so.

Mr. Youngdahl: I object to the reference to Plaintiffs' Exhibit 79 which was submitted at the pre-trial material, and we have reserved the opportunity to object. I just want to make sure that the objection is not waived during the oral hearing. We do object to any reference to Plaintiffs' Exhibit 79 being a kind of proceeding before another Board and other issues that is irrelevant and immaterial et cetera.

Judge Van Oosterhout: I think the Court understands that your objection is broad and that it is to cover all references to the proceedings before the Presidential Commission and the Arbitration Board.

[778] Q. Would you agree with me, Mr. Homer, that the opinion you expressed at the conclusion of your testimony on casualties and accidents differs somewhat to that expressed by Mr. Heath in the letter you just read? A. Yes.

Q. Turning now to specific pages of your exhibit, Mr. Homer, or your various exhibits. Referring first to Intervenors' Exhibit 43, you have details showing train miles for all United States railroads for a period of years. What is the source of your train miles figures shown in the first column?

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A. In the first column the locomotive and motor train miles, for convenience, were taken from Plaintiffs' Exhibit 109, page 25. As explained, I compiled this exhibit her[e] on my own portable typewriter for the purpose assemb[l]

here, I felt that the statistics contained in Plaintiffs' Exhibit were adequate for my general use.

Q. These are the statistics which Mr. Greer testified he adjusted in response to what appeared to be errors in the reporting data which he discussed with the Interstate Commerce Commission. Is that correct? A. That is correct.

[779] Q. And you used those statistics in your exhibit IX-43. Is that right? A. Yes.

Q. You also show some gross ton miles. I notice that is for Class 1 line haul railroads, is it not? A. Yes.

Q. You don't have a figure comparable to the train mile figure you have shown there, do you? A. No, I think there is no readily available figure that I had access to here in Hot Springs, at any rate.

Q. In any event, it is on a different basis, isn't it, Mr. Homer? A. Yes, it uses only Class 1 line haul railways.

Q. And the same thing is true of the employment figures you use on that table? A. Yes, that is correct.

Q. And you make the comparison, nevertheless, with train miles for all U. S. railroads. Is that correct, Mr. Homer? A. Yes.

Q. Now, you also discussed yesterday and also today Plaintiffs' Exhibit 114, which Mr. Greer put in, which was put in to show the effect of the reduced employment of firemen when casualty rates are computed on a man hour basis. Let me ask you, generally, Mr. Homer. Isn't it a fact [780] that if you have a certain group of employees within a composite group whose casualty experience is lower than the average for the composite group, and if you eliminate the hours and the casualties for that group of employees that the resulting casualty rate computed on the man hour basis is going to be higher than it would otherwise have been? A. Of course.

Q. Isn't it also a fact that between the period, during the years 1964 and 1965 there were fewer man hours pro-

portionately for firemen in through freight, local freight and yard service than were reported for the other employees working in those classes of service? A. Yes.

Q. Isn't it also a fact, Mr. Homer, that the casualty rate for firemen in through freight service, Class 126, was lower than the casualty rate for brakemen and conductors in that class of service? A. Yes, that is generally true.

Q. And it was lower by a substantial amount, was it not? Let's take a look at those casualty rates for just a minute. Through freight brakemen. Will you read me the casualty rate shown on that exhibit for 1963? A. 1963 the rate for through freight brakemen was 41.26.

Q. Firemen was what? [781] A. 13.98.

Q. And for local freight brakemen, what was the casualty rate? A. 43.60.

Q. The firemen was what? A. 8.34.

Q. For yard firemen what was it, Mr. Homer? A. For yard firemen?

Q. Yes. A. 4.76.

Q. For yard brakemen what was it? A. 41.05.

Q. So there are substantial differences in casualty rates, are there not? A. Oh yes.

Q. Now, to be sure that we understand what Mr. Greer did on this exhibit. Isn't the effect of what he did was to take the casualty rate for 1965 and to weigh them by using 1963 man hours for all of the classes shown? A. Yes, he did that.

Q. And the effect of that computation is shown then in the bottom half of the table, is it not? A. Yes.

Q. So that while the unadjusted casualty rate, composite for [782] the entire group in 1963 was the same since he did not adjust 1963. In 1964 the unadjusted figure was higher than the figure computed by using 1963 rate for hour, was it not? A. Yes.

Q. And the 1965 figure represented a greater difference than the figure used shown for 1965 where 1963 man hours is used. Isn't that true, Mr. Homer? A. Yes.

Q. Intervenors' Exhibit 44, the next document, Mr. Homer. If you would turn to page 5 of that exhibit, please. Did I understand you to say in response to questions asked by Mr. Youngdahl that the trend in train accidents that you have been talking about is a trend which is primarily one characteristic of the period since 1964? A. If I so responded, I think I made it clear when I discussed the statistics relating to train accidents that there have been increases in train accidents throughout the whole period from 1961 through 1965.

Q. The trend that you are talking about is the trend which started really in 1961. Isn't that true, Mr. Homer? A. That is true.

Q. It started some three years before there was any change of crew size under the Arbitration Award? [783] A. Yes, I think my figures all reflect that fact.

Q. On page 6 of the same document, Mr. Homer, there is a reference—the Commission refers to an investigation in Docket No. 33440, Prevention of Rail-Highway Grade Crossing Accidents involving railway trains and motor vehicles. Are you familiar with the report to which the Commission refers? A. Yes, I have seen the report. It has been sometime since I have examined it.

Q. Do you know whether or not the Commission in the report made findings and conclusions which were to the effect that the reason for the change in the volume of grade crossing accidents was the carelessness and irresponsibility of the drivers of motor vehicles? A. I'd rather really not recall what is in that document. It is a rather lengthy one, Mr. Lucente.

Q. You don't recall that the Commission found to that effect? A. I don't recall the specific findings they made at this time.

Q. This, I take it, is something, a published report of the Commission that has been referred to, I will not read it at this time. Referring now to IX-45, which is excerpts

from the Eightieth Annual Report. My questions about this document involve page 9, where certain tables appear. These tables were attached to the Commission's report, [784] and they are not your tables? A. That is correct.

Q. I notice that the first table there, Table 1, contains data with respect to railroad and grade crossing accidents for the period 1962 to 1965. At the bottom of that table the second line from the bottom does the Commission also set forth ton miles for those areas? A. Yes, both ton miles and passenger miles.

Q. And it has done this in a table which otherwise is devoted to casualties arising from railroad and motor vehicle collisions at grade crossings. Is that correct? A. Yes, those are on that same table.

Q. Doesn't the Commission in fact compute casualty rates or fatality rates on the basis of train miles? A. It does in its monthly report, M. 400.

Q. Doesn't it also do it in its annual Accident Bulletins, Mr. Homer? A. I can't recall any table where it is done in its Accident Bulletins except for when it makes comparisons of the casualties of all persons, it does.

Q. Do you have the Interstate Commerce Commission's Accident Bulletin No. 133 with you, Mr. Homer, for the year 1964? A. Yes, I have.

Q. Will you turn to page 1 of that bulletin. Isn't the very [785] first table on that page a ten year table showing the casualty rate for railroad fatalities on the basis of railroad train miles? A. Yes. Of course, the table includes all classes of individuals. I might say I would use the same train miles for that purpose if I were making such an investigation. It gets a relationship between the total number of casualties on all types of individuals and the extent of operations.

Q. Isn't it the Commission's way of showing casualty rate with respect to the persons included in that first table, isn't it, Mr. Homer? A. Yes.

Q. Intervenors' Exhibit 48 is the next document, Mr. Homer.

* * * *

Q. If I may take advantage of the question that Judge Henley asked you yesterday, do you know whether or not the statute known as the Power Brake Act of 1958 is current legislation? A. I believe it still is. I don't think there has been an amendment since that time. I do recall that it was amended and that the Power Brake Act was enacted in 1958.

[786] Q. That was the first time that there was a statute relating to that subject, was it not? A. Yes.

Q. And didn't the Power Brake Act impose numerous and various requirements with respect to the maintenance and characteristics of brakes on locomotives, Mr. Homer? A. Oh, yes.

Q. In fact, it adopted a very detailed set of regulations governing inspection and other incidents of operation of such brakes, did it not? A. Yes.

Q. With respect to the question of locomotive inspection regarding which you show certain data, is there a currently pending proceeding before the Interstate Commerce Commission in which you are participating with respect to that subject? A. Yes, there is.

Q. Do you represent the railway labor executive association in those proceedings? A. Yes, I was asked by them to submit testimony in that proceeding.

Q. Did your client in that case propose certain changes in the locomotive inspection rules? A. I believe they did not. They were actually joined with the Bureau of Locomotive Inspection in resisting the [787] efforts of the railroads to make changes in the current law.

Q. Has there been an examiner's report? A. I haven't seen it if there has been one.

Q. You are not familiar with the examiner's report? A. I am not.

Q. You are not familiar with the report of Division 3 involving that same litigation? A. No, I am not. I don't know why my attention hasn't been called to the fact that there was a decision. But I was not so informed.

Q. So if it is a fact that the Commission has approved prior practices with a few modifications such as those sought by the railroad, you aren't informed on that subject? A. Exactly, uninformed, and I am obliged to you for telling me something that the people that you referred to as my clients didn't see fit to advise me of.

Q. Page 1 of your Exhibit IX-48, Mr. Homer. It has certain details with respect to per cent of cars found with defective safety appliances for certain years. Are these the dates that you considered to be the most relevant dates for purposes of the presentation made by the table at that page, Mr. Homer? A. You mean the selection of years?

[788] Q. Selection of years, yes. A. I think these were designed to show the pre-war situation versus the latest period that we have.

Q. Did you introduce an exhibit in the Wisconsin case that contained comparable material, Mr. Homer? A. Some similar material were covered in the Wisconsin litigation.

Q. Do you know whether or not you used the same years to show the data in the Wisconsin case? A. I don't recall.

Q. You used vastly dissimilar years, did you not? A. I can't even recall what years I used.

Q. Do you have your Wisconsin exhibit with you? A. I don't have them here.

Q. Did you prepare the table with respect to defective safety appliances in this case without any examination of the material you put into the Wisconsin case less than a year ago? A. Well, if it was material to this case I was advised of a previous court decision that went back into the 1920's, into the 1930's, and I did select years that I thought would have at least some general relationship to that period.

Q. Does that explain why you showed the period 1955 to 1965 on Table 1? [789] A. 1955 to 1965 was the latest period of years for which I had information.

Q. The copies of your exhibits on the Wisconsin case that I have shows that you used the years 1959 to 1965 for that presentation. Any particular reason for varying the dates, Mr. Homer? A. Only that I showed a longer period of years in the earlier period covered, and I felt it was more appropriate to cover a similar period for the latest period.

Q. You also made some comparisons in the exhibit between the individual railroads involved and the railroads as a whole, do you not? A. Yes.

Q. Is it a fact that there were different railroads involved in the Wisconsin litigation than are involved in this litigation? A. I believe they are all different, as I recall it.

Q. Did you examine the data and find that the years that you have used here would be more helpful for your purposes as far as plaintiff railroads are concerned? A. No, I made no such judgment on that basis, Mr. Lucente.

Q. At page 3 you show there with respect to locomotives found defective, the percentage shown there is the percentage out of those inspected, is it not? A. Yes.

[790] Q. It is not a percentage of all locomotives? A. No, that is correct.

Q. On the next page you do show additional data, page 4, this one clarifying the question with respect to per cent, locomotives ordered out of service which appears in the final column on that page. It has been suggested to me that the connotation derived from that is the locomotive scrap is no longer used. That is not a fact, is it, Mr. Homer? A. Locomotives scrapped?

Q. It is just ordered out of service until the repairs are made, isn't it? A. That is right. Certainly I didn't intend to convey the suggestion that these locomotives were scrapped.

Q. I didn't get that impression, but I asked the question for the purpose of clarification.

Judge Miller: He has covered exactly that they were removed subject to improvement.

A. That is a fact.

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[791] Q. Mr. Homer, turning to Intervenors' Exhibit 50, page 10, you have a table showing all train accidents and collisions by broad general causes for the year 1964. The first item which appears there is under the heading "Employee Errors." Do I understand that the causes included under employee errors are those which are designated in the cause code as negligence of employees? A. Yes, that is correct. I thought I explained that when I introduced them originally.

Q. And you have included in that category all of the numerous cause codes shown at page 4 and subsequent pages 5, 6 and so forth of your exhibit? A. Yes.

Q. Do you have an estimate as to the number of cause codes with respect to individual causes that are included under that category, negligence of employees? A. I haven't counted them. There are probably, looking at them generally, something in the neighborhood of a hundred perhaps.

[792] Q. On page 11 of that exhibit you have shown the number of collisions on a monthly basis for the years 1961 to 1966, through part of 1966, that is. Let me ask you first, does the term "all United States railroads" include a number of railroad and switching companies other than the Class 1 line haul railroads? A. Yes, it does.

Q. It includes more railroads than were parties to the Award of Arbitration Board No. 282, does it not? A. Yes, that is correct.

Q. Do you know approximately how many carriers are parties to the Award of Arbitration Board No. 282? A. I believe one of the tables submitted in your Exhibit 109

listed sixty-seven. I believe there were other smaller railroads, however, that were also parties.

Q. Do you know how many Class 1 railroads there are, Mr. Homer? A. I had assumed that that number sixty-seven shown—you mean altogether?

Q. Altogether. A. I believe there are seventy-two now.

Q. How many Class 2 carriers? A. I haven't seen any recent figures.

Q. Does the number 287 sound approximately right to you? A. Well, I haven't checked it, but it might be.

[793] Q. And then there are also switching and terminal companies included in the group that you have included on this table, are there not? A. Yes.

Q. Do you know whether there are approximately 207 switching and terminal companies also included in the specifics you show at page 11? A. Again, I haven't counted them, Mr. Lucente.

Q. You made comparisons on this table which to some extent uses a three year average with which to compare statistics in single years subsequent to the three year period included in the average, have you not? A. Yes.

Q. As I understand or remember your explanation of that device, it was that the three year average was used because of the variations which normally occur from year to year? A. Yes.

Q. Have I stated that correctly? A. Yes, that is correct.

Q. But in making the comparisons with the base out of which the year to year variations have been removed, do you not make comparisons with the single year which does have the possibility of a normal variation in it? A. Certainly.

[794] Q. So you take the variation out of the base and you make a comparison then with an item which is inherent to the difficulty of variations from year to year, isn't that right? A. Yes, but I have supplied all of the figures from

which the judgment may be made as to whether this was a temporary effect or one that carried forward into later periods.

Q. At page 12 of this exhibit, Intervenors' Exhibit 50, you have placed the same information on a rate basis, as I remember? A. That is correct.

Q. With respect to the footnote at the bottom of your table there, Mr. Homer, you have explained the manner in which locomotive and motor train miles have been computed by you. Earlier in my examination of you we referred to train miles which you included in one exhibit which were the same as those that Mr. Greer arrived at by the adjustment process which you described? A. Yes.

Q. Here you have a different means of computing train miles for purposes of this table, have you not? A. I have.

Q. In computing train miles from the miles actually run in road service, are only the miles counted that are run between [795] terminals in road service? A. Yes.

Q. If a train operates from terminal "A" to terminal "B" a distance of ninety miles, and in the process spends five hours performing station switching at intermediate points, what are the train miles that are reported for that run? A. Train miles are derived from engineer's miles would be only those miles, in road service now, the miles between terminals.

Q. Your train miles here then omit completely the train miles that are reported to the Commission as train miles when a road train stops at intermediate points to perform switching. Am I correct about that? A. Insofar as road train operations are concerned, that is correct.

Q. And in reporting train miles to the Interstate Commerce Commission the time devoted to such intermediate switching is diverted to train miles by using a factor of six miles per switching hour. Is that correct? A. That is correct.

Q. But those miles do not appear in your train miles

here at all? A. Not so far as road switching is concerned, Mr. Lucente. There is no process by which that can be done. To the [796] extent to which yard switching is done, that factor is included in these figures, of course.

Q. Well, the train miles that Mr. Greer used is not subject to the difficulty you and I have been discussing? A. They will include, subject to the accuracy of Mr. Greer's very broad average technique, they will be included.

Q. The accuracy of that technique did not deter you from using those train miles in the exhibit that we discussed awhile ago, did it, Mr. Homer? A. No, it did not. I think I should explain, the difference between Mr. Greer's methods and my methods on a year to year basis is very small. It is only when you get into month by month variations that Mr. Greer's method fails to take into account the monthly variations in operations, and my method does take those into account.

Q. Your method takes into account variations in certain factors that doesn't take into account one factor at all, does it, Mr. Homer? A. That is correct.

Q. On page 16 of your exhibit dealing with collision rates on train miles. Do we have here another means of computing train miles, Mr. Homer? A. Yes, these are transportation service train miles, and they are not computed. These are the actual Interstate [797] Commerce Commission figures.

Q. Do these transportation service train miles include any miles attributable to yard switching hours? A. No, they do not.

Q. The collisions that you have included in your tables do result from yard operations to a large extent, do they not, Mr. Homer? A. Well, they include—yes, many collisions resulting from yard operations.

Q. You include the collisions but not the miles. Isn't that what you have done? A. Of course. It was for that reason, Mr. Lucente, that I used the table on page 15 and

on page 16 to indicate that the divergence caused by the absence of those miles is very minor from a statistician's standpoint.

Q. Well, it shows entirely different rates when you use transportation service miles, doesn't it? A. Yes, but in terms of the change from period to period, it makes no difference.

Q. You also have omitted from the transportation service miles included here the conversion of road switching miles on the six miles per hour basis, haven't you, Mr. Homer? A. Yes.

Q. Intervenors' Exhibit 51. This utilizes in part separation of carriers into two different groups that Mr. Greer made [798] in his exhibit? A. That is correct.

Q. In the course of your examination about this exhibit and others based on the sixty-four carriers that Mr. Greer has used in his Wisconsin presentation, did I understand you to suggest that there was something inaccurate or subversive about the change in the number of carriers used in the Wisconsin case as distinguished from this case, Mr. Homer? A. I hope I didn't suggest any such inference.

Q. Did Mr. Greer furnish you a list of the carriers that comprised the sixty-four that he used in the Wisconsin case? A. Yes, he did. Otherwise I could not have made these computations.

Q. And there is also in his exhibit, Plaintiffs' Exhibit 109, a list of the carriers which he used in this case, is there not? A. Yes.

Q. You know which three carriers are added to Mr. Greer's sixty-seven group in this case as distinguished from the group of sixty-four in the Wisconsin case? A. My work sheets will show them, but I can't automatically tell you which they were.

[799] Q. Now the computations which Mr. Greer made for the Wisconsin case were stated by him when he testified to be based on the data he had available to him at that

time which extended the sixty-four carrriers. Do you recall that testimony? A. Yes.

Q. Do you also recall that Mr. Greer's exhibit in the Wisconsin case showed that the sixty-four carriers with respect to which he presented data represented 95.4% of the 1965 train miles of all the Class 1 line haul railroads? A. I recall he submitted figures of that kind. I don't recall the specific figures you mentioned.

Q. And in this case doesn't his exhibit, Plaintiffs' Exhibit 109, shows that the presentation is in terms of 96.1% of all of the Class 1 line haul carriers? I refer to Plaintiffs' Exhibit 109, page 11. A. Yes, I see the figure 96.1.

Q. If he presented data with respect to 95.4% of the Class 1 line haul mileage in Wisconsin and 96.1% here, wouldn't you agree with me that the carriers were substantially the same group in both cases, with a few minor additions? A. Certainly.

Q. Isn't it possible that those additions were made because subsequent to the Wisconsin case the more data became [800] available from the three carriers added to the list? A. I will certainly accept that explanation.

Q. The table appearing as Intervenors' Exhibit 51 makes a comparison at the bottom, percentage increase 1966 over the average. The average that you show is computed on the calendar year basis. Isn't that right, Mr. Homer? A. Yes, it is.

Q. The 1966 period that you use, however, is a fiscal year, is it not? A. Yes.

Q. Do you consider that proper statistical technique to compare a fiscal year with a calendar year? A. Yes, I do.

Q. With respect to the point that we were discussing a moment ago about taking the variable out of the average but keeping it in the single year in which the comparison is made, do you recall—I am sorry, you have a blank look on your face: A. I am not aware what you mean when you say take the variable out of the average but——

Q. Do you recall a moment ago we were discussing the fact that your comparisons in several of these tables, including that one that we have here, is based on a base period which averages three years. [801] A. Yes.

Q. And as I understood your testimony, you used that as the base period to take the variable out, the year to year variations, in other words. A. It is not to take the variable out. It is to make sure that any infirmity in any one year will affect the relationship to the later years in the subsequent period. And by taking an average of the three, you get what is a more representative figure for the entire period prior to the Arbitration Award in this case.

Q. Taking the year 1963 as shown in column 1 of your table, Mr. Homer, you show 528 collisions for that one group of carriers in 1963, do you not? A. Yes.

Q. Your average, however, is 499 for the three year period? A. That is correct.

Q. That is a difference, as I calculate it of 29 collisions. A. Perfect arithmetic.

Q. Do you consider it proper to make the comparison with 499 instead of comparing year with year? A. Yes, I do.

Q. Intervenors' Exhibit 52. The only thing I really wanted to ask you about there, Mr. Homer, has already been covered. You have used here again the transportation [802] service miles which does not include yard service switching hours converted to miles, or road switching hours converted to miles? A. Yes. That was done, of course, you understand, Mr. Lucente, because Mr. Greer in his exhibit did not furnish us the transportation miles he used in his calculations nor did he furnish the number of collisions in addition to the collision rates.

Q. Did you request that information? A. I beg your pardon.

Q. Did you request that information of him? A. No, I didn't request it of him.

Q. Did you anticipate that Mr. Greer would provide that information for you? A. I would believe it essential element to furnish one or the other, primarily, Mr. Lucente, because Mr. Greer was presenting here statistics based on what is essentially private data.

Q. Did you, in the company of Mr. Ross, appear at Chicago on March 6 to take Mr. Greer's deposition? A. I was in Mr. Ross' company at that time.

Q. Did Mr. Ross interrogate Mr. Greer with respect to his testimony in this case? A. He did.

[803] Q. Did you make any request of Mr. Greer for the kind of information you are now describing? A. At that time I didn't have a copy of Mr. Greer's exhibit and I didn't know that he was going to bring in information based on private data.

Q. Did I send that exhibit to you on March 13, by air mail, Mr. Homer? A. Yes, you did.

Q. When did you receive it? A. I received it on the afternoon of Tuesday.

Q. That would be March 14? A. March 14.

Q. And you haven't had occasion to inquire for the data since that time, have you? A. No, I did not inquire about it, because as in case of the Wisconsin exhibit of the same kind I found that I could make a representative and valid comparison of the same type using transportation miles which show the change in service, although they may not represent the same aggregate rate figures.

Q. These transportation miles are the miles we have been discussing? A. That we have been discussing, yes.

Q. Plaintiffs' Exhibit—I am sorry, Intervenors' Exhibit [804] 53. I notice when you referred to this fact when you testified on direct, Mr. Homer, that you have shown no comparison for the years 1964 to 1966 in this grouping of years at the bottom of the page, have you? A. That is right.

Q. This is on the basis of the twelve month period ending June 30, isn't it? A. Yes.

Q. So a comparison extending from June 30, 1964, to June 30, 1966, would include virtually all of the months in which the Award of Arbitration Board 282 had been in effect, wouldn't it? A. A comparison based on the year 1964 ended as of June 30 of that year would include two months in which there was operation under Arbitration Award 282.

Q. So if you start in June of 1964 and come down to June of 1966, you are omitting as far as available data is concerned, only two months of the operative effect of Arbitration Board Award No. 282? A. You are including, not omitting. You are including in the first of those years statistics which at least in part reflect the operation of Arbitration 282.

Q. You and I aren't understanding each other. I am talking about a comparison, Mr. Homer, which starts with June 30, [805] 1964, and covers the twenty-four months period to June 30, 1966. Now that includes virtually all of the effective period of time for the award except for May and June of 1964. Isn't that true? A. That is correct.

Q. No such figure appears in the group of figures at the bottom left-hand side of your page, does it? A. No.

Q. What would that figure be if you had inserted it? A. I have made no effort to compute it.

Q. You can compute it from the data appearing immediately above there, can't you? A. No, I think no.

Q. Well, isn't the change from 1964 to 1966 a change of .25? A. That figure, of course, is shown on Mr. Greer's exhibit. I am sorry I misunderstood you. I thought you wanted some composite made of the several fiscal years.

Q. I am asking you what the figure would be from 1964 to 1966 comparable to the figures that you have shown on the left-hand side of your page for several periods of time from which the 1964 to 1966 figure is missing. And isn't the answer to that .25? A. I am apparently not understanding your question.

Q. You have data there showing collision rate twelve months [806] ending June 30, 1962, 1963, 1964, 1965 and 1966, do you not? A. Yes.

Q. Now, what was the collision rate for the year ending June 30, 1964, Mr. Homer? A. 1.40.

Q. What was the collision rate for the year ended June 30, 1965? A. 1.57.

Q. What was the rate for the year ended June 30, 1966? A. 1.65.

Q. Isn't the change from 1964 to 1966 .25? A. Yes, that is correct.

Q. I have no questions with respect to Intervenors' Exhibit 54 and 55, but I do have several about Intervenors' Exhibit 56. If I understand your testimony about Intervenors' Exhibit 56 correctly, Mr. Homer, you emphasize what you considered to be a relationship between crew size and the types of accidents that you have shown on that page. Is that the purpose? A. I selected these causes, which I think I indicated in my direct testimony, as being among those which would have some relationship to crew size.

Q. And didn't you emphasize in your direct testimony the [807] changes which are represented by comparing 1964 with the prior years shown on that table with respect to the various groups? A. Yes.

Q. Your cause 1702, failure to secure hand brake, which show the total number of accidents in 1964 of 272. Isn't that the type of thing which would be the responsibility of the ground crew in yard service primarily? A. Yes.

Q. Will you tell me what important crew size change took place in 1964, Mr. Homer, affecting ground crews in yard service? A. I have no knowledge to the extent to which Special Boards of Adjustment under 282 may have change crew consist during that period.

Q. Isn't that the assumption on which you discussed this data when you testified on direct this morning? A.

Yes, that is the assumption on which this particular group was chosen.

Q. We will come to others in just a moment; pertaining to this one. A. Yes.

Q. The fact is, that there were very cumbersome and lengthy procedures which had to be followed before a special [808] board could be established under the Award of Arbitration Board 282. Isn't that a fact, Mr. Homer? A. Insofar as the train crews and yard crews are concerned.

Q. That is what we are talking about with respect to cause number 1702, isn't it? A. Yes.

Q. You have no information then, at all, to support your assumption that there was a reduction in the size of yard crews in 1964 which could be suggested as the cause for the increase of the accidents in Cause Code number 1702, do you? A. I have no information to the extent to which those Special Boards of Adjustment may have reduced the size of such crews.

Q. Taking the next cause, switch improperly set. That again is largely a matter of how well the yard ground crew or the ground crew on a road freight train performs its functions, isn't it? A. Not entirely.

Q. Are you suggesting that the engine crew throws switches, Mr. Homer? A. No, but I am suggesting that the engine crew in yard service, in particular, might in slow operations be able to detect that the switch was thrown incorrectly and stop the train before a derailment occurred.

[809] Q. Doesn't the engine crew in circumstances of that kind proceed on the signal of the man on the ground? A. I think they may proceed under many circumstances.

Q. In yard service? A. Yes. They have to go through switches in yard service.

Q. From your familiarity with railroad operations, wouldn't you agree that a switch improperly set is pri-

marily the responsibility of the ground crew rather than the engine crew? A. Certainly the setting of the switch, that is true.

Q. One of the largest categories you have there is one which I have difficulty finding, but—the last one before the total. Would you read that cause code. Mine is illegible. A. 1917?

Q. Yes. A. Absence of man on or at leading car being pushed.

Q. Who rides the leading car? A. I would normally expect a yard helper.

Q. And if the yard helper isn't there, that is the responsibility of the ground crew, isn't it? A. Well, he would be a member of the ground crew.

Q. And here again you have shown an increase on the assumption that there was some change in the size of the yard ground crew which made this somehow relevant in the case. Is that right, Mr. Homer? [810] A. Yes.

Q. But you don't know that that is a fact, do you? A. No, as I replied before.

Q. Intervenors' Exhibit 57, Mr. Homer, you have shown here casualties in train operations to train and engine service employees by months for various years. These are aggregate rather than any showing of casualties? A. Yes, they are.

Q. But you do show for 1966, do you not, a decrease in many of the comparable months of 1965? A. Yes.

Q. January of 1966 is lower than January, 1965, isn't it? A. Yes.

Q. The same is true of February, isn't it? A. Yes.

Q. March? A. March is lower.

Q. April? A. April is lower.

Q. Now, we come to a different situation. May is higher? A. May is higher. June is slightly below.

Q. Do you have the data for July and August? A. No, I do not.

Q. Mr. Greer introduced statistics for those two months did he not? [811] A. I don't believe he gave the monthly figures, though.

Q. I believe he did. I don't have the page reference to his exhibit at this point, so we will just skip it, but my notes indicate that he showed a total of 890 for July and 870 for August. But in any event, the data which you have there for 1966 does show the pattern that we have been discussing? A. There has been a decrease in aggregate casualties.

Q. On page 2 of your exhibit you have put the casualties shown on page 1 on a rate basis, haven't you? A. Yes.

Q. In terms of man hours? A. Yes.

Q. And here again, of course, you have included the man hours reported to the Commission for the various years? A. That is correct.

Q. The discussion we had this morning about Plaintiffs' Exhibit 114 with respect to reduced employment of firemen and its effect on casualty rates would be relevant to the table, would it not? A. Among other things, the change in employment mix will affect the rate.

Q. What man hours have you used in computing the rate on this table, Mr. Homer? [812] A. The man hours here are the man hours of train and engine service employees.

Q. The eighteen classes or the twenty-two? A. The eighteen classes.

Q. At page 3 of your exhibit, Intervenors' Exhibit 57, you have shown casualty rates for the sixty-four Wisconsin railroads. I use that term to identify the railroads that Mr. Greer used in his Wisconsin presentation. A. The same railroads.

Q. The casualties you have shown here are to all employees on duty. Is that right? A. That is correct.

Q. Arising out of train and train service accidents? A. Yes.

Q. What man hours did you use in computing the casualty rate shown on that page, Mr. Homer? A. Necessarily I had to use the man hours of all of the railroad employees.

Q. You used the man hours reported for the entire 128 classes of railroad employees? A. Yes, it was necessary to do that.

Q. Including executives, minor officials, clerks and every other class that worked for the railroad. Is that correct? A. Absolutely, necessary to do that under these circumstances.

[813] Q. And you used those hours to compute a rate based on casualties accruing in train and train service accidents? A. I did.

Q. What percentage of those casualties accrued to the eighteen classes of employees who worked in the engine and train service. Do you know? A. I haven't computed it, Mr. Lucente, but I think it is quite clear a very, very large percentage would, of course, affect, train and engine service employees, and a very small proportion of them are the non-operating employees.

Q. It is in the nature of 85% of the casualties accruing to the eighteen classes of train and engine service employees and about 15% to the other classes, isn't it, Mr. Homer? A. I will accept your figures, subject to check. I don't have them.

Q. If you were to divide the hours that enter into this computation which accrue to the eighteen classes of train and engine service employees and compare those hours with the hours accruing to the other 110 classes, what sort of a percentage would you have in spite of that division? A. I believe it would be about 30% of the train and engine [814] service and some 70% for the other group. But that is a very rough figure.

Q. Now, the hours that maintenance of way employees work, for example, fluctuate sometimes very violently from year to year, do they not, Mr. Homer? A. There is

a considerable amount of seasonal fluctuation for maintenance of way employees. The year to year fluctuation, I believe, is not quite as significant.

Q. Would you agree with me as a general matter that apart from the eighteen classes of employees who are train and engine service employees that there are many factors unrelated to the operation of trains which cause fluctuations in the hours worked by other employees on the railroad? A. Of course.

Q. I believe that is all I have on Exhibit 57.—Exhibit 58. Is this again the use of hours for all classes? A. Yes.

Q. To arrive at a casualty rate with respect to casualties arising out of train and engine service accidents, or train and service accidents? A. Train and train-service accidents. That is correct.

Q. Intervenors' Exhibit 59, Mr. Homer, if I understood your testimony about this exhibit on direct, you stated that passenger service covered by your statistics here [815] was not affected at all by the Award of Arbitration Board 282. Did I understand you to say that? A. That is my understanding.

Q. Don't you know that passenger service was subject to change under the Special Board of Adjustment procedure insofar as crew consist is concerned if the consist of the crew was either above or below a certain stated number? A. I believe, Mr. Lucente, now I do recall reading that section of it. I don't recall exactly the details of it. I had forgotten that fact.

Q. There have, in fact, been special boards which have passed on the required size of crews in passenger service during the period covered by your exhibits? A. I didn't know that.

Q. Now, you also said, as I remember it, that this passenger service was a service operated typically with firemen? A. Yes.

Q. Does your passenger grouping here include all the

railroads which operate commutation service in the United States? A. These are passenger operations for all United States railroads, and that certainly would include commutation service.

Q. Do you know whether or not the Long Island Railroad operating in the New York area uses firemen on its passenger crews? [816] A. It does, I am quite sure, in those parts of its operation which are diesel.

Q. But isn't it a fact, Mr. Homer, that a very large segment of the passenger service operation in the East—of the Long Island, New Haven, New York Central, Delaware-Lackawana, is so-called M. U. service which operates with only an engineer in the cab? A. Most of it in M. U. service, most of it operates without a fireman.

Q. The same is true of the Illinois Central operations in Chicago? A. Yes.

Q. So your comments about the firemen being on all of the crews with respect to the passenger operations covered by these statistics is not accurate, is it? A. I believe the record will show that I mentioned the fact that they aren't present in commutation service to a substantial extent.

Q. You don't have any figures showing the proportion of that type of operation to the straight-away passenger service? A. No, I don't. I don't have any recent figures.

Q. Intervenors' Exhibit 60. What classes of employees are included in the employees covered by your table on page 60? [817] A. 60?

Q. Yes. A. These casualties, and that is all that is shown, will be casualties to all classes of employees.

Q. That would be 128 classes or railroad employees? A. That is right. Most of the casualties, of course, would affect just the train and engine service employees.

Q. Intervenors' Exhibit 62. I notice that you have not included data for 1966, Mr. Homer. Can you tell me why you omitted that data from the table? A. No, I covered all of the full years for which I had information.

Q. Didn't you testify that you took this data from Mr. Greer's exhibit? A. Are you talking about Exhibit 61?

Q. 62. A. Oh, I am sorry.

* * * *

[818] Q. Intervenors' Exhibit 62. Will you examine Mr. Greer's table at page 20. That is Plaintiffs' Exhibit 109. A. Yes, I have it.

Q. Does that show data for 1966? A. Yes, these, of course, are based on fiscal years ending June 30.

Q. You did not include it in the table you have here? A. No, where I used calendar years.

Q. What does Mr. Greer show for the fiscal year ended June 30, or is it August 30, 1966? A. No, it can't be August, I am sure. June 30. Mr. Greer shows 63.

Q. For Arkansas? A. For Arkansas.

Q. What does he show for all other states? A. Well, he shows all states, I believe, 6335. We would have to subtract the 63 from that. It would be 6272.

Q. Just one matter about your casualties, one other matter about your casualty data, Mr. Homer. Intervenors' Exhibit 63, please. With respect to casualties in rail-highway grade crossings, Arkansas and all other states, your exhibit shows, does it not, that in Arkansas casualties increased from 82 to 91 from 1964 to 1965? A. Yes.

[819] Q. And in all other states there was a decrease in the casualties, was there not? A. Yes, there was.

Q. This is the period of time including many of the effective months of Arbitration Award 282, is it not? A. That was certainly true of 1965.

Q. Intervenors' Exhibit 65. Perhaps just a few general questions can dispose of this exhibit. Mr. Homer, in Intervenors' Exhibit 65 you have shown unit charge-out prices for materials and supplies for the railroads of the United States? A. Yes, I have.

Q. I understood you to say that this was intended to

show that Mr. Greer's showing with respect to the increased cost of equipment did not really indicate that there were more train accidents reportable because of the $750 limit due to increases in car values and related things. Is that the gist of your testimony? A. I didn't testify to that effect, Mr. Lucente. I said that these are an index of the change in the prices of railroad materials and supplies. Mr. Greer's exhibit addressed itself to the total cost of new equipment.

Q. Mr. Greer, cited t e example in discussing his data of the damage involved in repairing, or in an accident [820] which accrued to a roller bearing car as against one with the antecedent hotbox, antecedent axle. Does your data show anything at all with respect to the relative costs of repairing a journal with roller bearings in it as against the more ancient type of journal? A. No, I think not, but I think that it is quite clear that very few roller bearing cars that I have ever heard of have hotboxes, so there would be a compensating element working in the other direction. You wouldn't have the derailments due to hotboxes on this other type of car.

Q. Perhaps that has some relevance to the table shown on page 4 of your exhibit, Mr. Homer, where you have shown unit wage cost for maintenance of equipment employees. You have just stated, as I understand it, that the newer type car with the roller bearings is less subject to the type of mishaps which require repairs. Is that correct? A. That is correct.

Q. Would that be an explanation of the reason why maintenance of equipment employees are less of a cost factor when their cost is put in terms of train miles? A. It would be one element in that.

Q. But the fact remains that if it takes maintenance of equipment employees one hour to repair a particular defect today [821] as against one hour to repair a defect of that kind ten years ago, the wage rate for that one

hour is substantially greater today, isn't it? A. No question but that the hourly wage rate has risen.

Q. I believe that is all I have on that.

Judge Henley: Mr. Lucente, in this vein, you might possibly want to look at some further information from Mr. Homer, and you may not. In connection with this exhibit, as I understood it the major portion of his pitch, if I may call it that, with respect to this exhibit was that the change in the reporting factor from $375 upward to $750 was not as big a factor as Mr. Greer had indicated it might be in causing more accidents to be reported. That because of the fact that whereas this reporting figure was double, the cost figure increase or index in the tables he had projected showed a lesser increase.

Mr. Lucente: Thank you, Your Honor, I will ask questions along that line.

Q. The $750.00 figure was established in 1957, wasn't it, Mr. Homer? A. It was.

Q. It has remained constant since 1957, hasn't it? A. Yes.

Q. So that any comparisons that are based on years subsequent [822] to 1957 are based on years during which there has been a constant dollar factor with respect to the reportability of train accidents. Isn't that right? A. That is right.

Q. And even if that constant dollar factor was disproportionately high in 1957, it would not invalidate the conclusion that its constancy since 1961 when compared with rising wage rates and increasing values of equipment would make more train accidents reportable, would it? A. You mean as between 1957 and 1961?

Q. 1957 and today. A. There are two parts to the question, Mr. Lucente. First of all, all the statistics, virtually all of the statistics that have been presented by me and by Mr. Greer have covered the period beginning in 1961.

Q. Let's eliminate the 1957 to 1961, and I think that may eliminate the problem. Most of the comparisons here are in terms of the 1961 against 1966? A. Yes.

Q. Now, regardless of whether or not $750 was a reasonable figure when it was established in 1957, it has remained a constant figure since 1961, hasn't it? A. It has.

Q. And when that constant figure is taken into account in [823] connection with increasing wage rates, increasing cost in value of equipment, isn't it valid conclusion that the number of reportable train accidents would increase without any substantial change in the number of mishaps occurring? A. I have never seen a statistic, a valid statistical proof that shows that. I do not believe that the cost of maintenance employees per hour is a valid basis for measuring that difference. I don't insist that my unit costs are the perfect element for that purpose. I do say there has been an increase in cost. There is no such thing as a unit cost per accident that I think can be used in that respect. As far as the material costs are concerned, I think they come closer to measuring the cost of all of the things that the railroads buy than the cost of cars that represent a long-term capital replacement and in which it takes many, many years to make a major change in the overall compositions of the equipment.

Q. Do you have a list of the items that go into the category of materials and supplies upon which the Commission constructs the cost price index? A. The Commission doesn't construct this cost price index, and I don't have such a list as I would have. It is compiled by the Association of American Railroads.

Q. It would be a very extensive list of many items which do not have anything to do with train operations, would it, [824] Mr. Homer? A. It would certainly be some.

Mr. Lucente: Your Honor, have I covered the point that you had in mind?

Judge Henley: Oh, yes. I was satisfied with it before.

Q. Mr. Homer, turning to your final exhibit, this is Intervenors' Exhibit 66, dealing with the Kansas City Southern. Mr. Youngdahl referred to certain exhibits introduced by the plaintiff railroads which show what the current wage costs are insofar as the third brakeman, third helper and fireman are concerned in Arkansas. Your exhibit doesn't, isn't intended to suggest that the wage costs which the carriers have shown for the year 1965—that is largely the year used—you aren't suggesting that those wage costs are not correctly shown, are you? A. In Mr. Farrar's exhibit?

Q. No, I am talking now about the Missouri Pacific. Let's take them one by one. A. Missouri Pacific.

Q. Do you agree that the Missouri Pacific has correctly shown the wage costs accruing to it because of the requirement that it keep on firemen, a third brakeman and a third helper on its Arkansas crew? A. My examination of Mr. Hall's statistics indicate that if [825] he has properly identified the individuals and the mileage for which the employees may be taken out of service, he has made a fair arithmetical computation apply wage rate to miles and to hours and making other standard adjustments. I take no issue with that arithmetic, if that is what you mean.

Q. Would you say the same about data introduced by the St. Louis Southwestern in plaintiffs' Exhibits 44 and 45? A. Yes, I think that is true of all five railroads, as far as that is concerned.

Q. In other words, you agree then that the five railroads have shown what you consider to be reason showings of their current wage costs, I mean reasonably accurate showings of their current wage costs, or wage costs for the year which shown, insofar as firemen and

third brakemen and third helpers in Arkansas is concerned? A. I believe that in all cases they did compute with a reasonable degree of accuracy, and they use different methods, with a reasonable degree of accuracy the approximate amount of money paid these employees. And in one or two railroads they use the actual time slips.

Q. But in your suggestion, as I understand it, that because of the increasing accidents and the overtime and the additional switching on route, the terminal delay, the effect [826] of the conversion rule, and a multitude of other factors that you offered the conclusion that wage costs really would not go down if these employees were taken off. Is that—am I stating it correctly? A. In general, that is very well expressed, Mr. Lucente.

Q. When Mr. Heath said in his letter to Senator Magnuson that engineers are moving the trains safely and efficiently over the road without firemen, do you suppose that he was referring to the kind of breakdowns, accidents, undue delays, etc., that you have assumed in expressing your opinion here? A. I have no idea what Mr. Heath was referring to in terms of specifics.

Q. Let's be perfectly candid about it, Mr. Homer. Your conclusion with respect to what is going to happen to wage costs in Arkansas is based on your assumption that if firemen are taken off and if third brakemen are taken off and if only two helpers are used on yard crews, that accidents will increase. Isn't that the basic assumption that you make? A. That is not assumption, Mr. Lucente. That is the conclusion I drew from my study of the statistics that I felt were most useful in appraising the situation.

Q. And you also assume, do you not, that if these crews are [827] reduced as I suggested, that there would be an increase in overtime insofar as the remaining crew members are concerned? A. Certainly maybe.

Q. Now, isn't it a fact, Mr. Homer, that the individual

railroads operating in states other than Arkansas, as well as those operating in Arkansas, report on a monthly basis, comprehensive wage statistics which permit a determination as to whether the result you have predicted has actually accrued in the state in which they are now operating without firemen. Isn't that correct? A. No, that isn't correct.

Q. Isn't overtime reported for engineers in local freight service by each individual railroad to the Interstate Commerce Commission? A. On a system basis.

Q. Isn't it reported that way for conductors in local freight service? A. Yes, but not for Arkansas, and not for the other states separately.

Q. You know, do you not, that on many railroads firemen have been taken off, and that crews have been reduced in yard and freight service as far as brakemen and helpers are concerned. You know that to be a fact? [828] A. I know it has been done, sure.

Q. Did you check any of the current wage data to determine whether or not the things that you are predicting here have in fact occurred under those circumstances? A. I have made no specific study of it, Mr. Lucente.

Q. And you base your testimony entirely on the conclusions which you describe with respect to Mr. Farrar's Exhibit 86. Is that correct? A. I took Mr. Farrar's unit cost per mile figures, and I came to the conclusion that those elements that I described among others, were those which could explain a relationship which absolutely existed in his figures.

Q. Now, you know that the Kansas City Southern is a relatively minor operation as far as Arkansas operations are concerned, don't you, Mr. Homer? A. I know they come in from Missouri from the North, they cross over into Oklahoma, and then come back into Arkansas and run down the length of, or the width of the state, running into Louisiana. I don't recall exactly how many miles there were.

Q. This appears in Mr. Greer's exhibit at page 27. The Kansas City Southern is shown as having 162 road miles in Arkansas, as against 3,471 for the combined five railroads involved here. Do you find these statistics to which I refer, Mr. Homer? [829] A. I see 162 miles on the Kansas City Southern.

Q. Follow that line across to the total in column 7. A. You mean out of 3,471 miles in Arkansas that it represents 162 miles out of 894 miles operated by the system?

Q. Out of the 3,471 road miles operated by the five plaintiff railroads here, the Kansas City Southern operates 162 miles. Isn't that correct? A. Those figures are correct.

Q. Now, the Missouri Pacific operates almost 50% of the total road miles in Arkansas, doesn't it, Mr. Homer? A. Those figures are shown, Mr. Lucente, in Mr. Greer's exhibit.

Q. Did you check the data for the Missouri Pacific to see whether or not the prediction you have made based on the Kansas City Southern data would be true with respect to the Missouri Pacific? A. No, I did not, Mr. Lucente. Of course, if there are such figures with the same significance on the Missouri Pacific Railroad, they are on file in Little Rock. Those figures wouldn't have been accessible to me in Washington. I believe Mr. Ross asked the railroads if they had information at this time, at one time prior to the trial, and he was not furnished copies of the Arkansas report.

[830] Q. I don't recall receiving such a request except for the Kansas City Southern.

Mr. Youngdahl: I don't think it is a thing we have to respond to at this time.

Mr. Lucente: I am sorry.

Mr. Ross: I will be happy to answer Mr. Lucente's question.

Judge Miller: We have the record full of everything else. Let's go ahead.

Q. You have been here in Hot Springs since Monday, haven't you? A. I have.

Q. You haven't bothered to check the records at Little Rock to see what the statistics are with respect to the Missouri Pacific? A. It is a little hard for me to be here and be in Little Rock at the same time.

Q. The data you have shown is based on figures applicable to 162 miles as to 3,000 some odd miles in Arkansas? A. Yes, sir.

Mr. Lessenberry: I misunderstood what was to be available in Little Rock.

Mr. Lucente: Mr. Farrar in his exhibit had two items of details which he identified as coming from the [831] Arkansas reports that the Kansas City Southern had filed, did he not? A. That is true, Mr. Lucente.

Q. There is one item identified as enginemen's wages? A. Yes.

Q. Another item identified as trainmen's wages? A. Yes.

Q. Another item identified as freight train miles in Arkansas? A. That is correct.

Q. And it was those items that he identified as coming from reports filed with the State of Arkansas that you relied upon to a great extent in producing the statistics which appear in Intervenors' Exhibit 66. Am I correct about that? A. That is correct.

Q. Had you examined the Missouri Pacific report for those particular items, you would have known, would you not, whether or not the Missouri Pacific situation was comparable to the situation that you have described for the Kansas City Southern? A. No, Mr. Lucente, I would not.

Q. Why not? A. I did not have the testimony of Mr. Hall to the same effect that I had the testimony of Mr. Farrar and Mr. Vallrath affirming the fact that these figures were representative of accidents, actual operations in Arkansas, not just arbitrarily allocated figures.

Q. Have you examined Mr. Vollrath's testimony recently with that point in mind, Mr. Homer? A. Yes, I have.

Q. Mr. Vollrath was an assistant director of personnel for the Kansas City Southern? A. Yes, he was.

Q. Do you know whether or not he is responsible for or participates in making up the reports that go to the Arkansas Commission? A. I do not know that.

Q. Wouldn't it be unusual for a personnel man to perform that type of function in the railroad hierarchy? A. I——

Mr. Youngdahl: I object.

Judge Van Oosterhout: Objection sustained.

Mr. Ross: Mr. Vollrath was made available to us for the purpose of taking his deposition, instead of Mr. Farrar whom we understood was ill and unavailable at the time. It was our understanding that whatever Mr. Vollrath testified to would apply to the Kansas City Southern that would have been supplied by Mr. Farrar.

Mr. Lucente: That concludes our cross-examination

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[833] Mr. Youngdahl: We at this time offer Intervenor's Exhibits 42 through 67 in evidence.

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Mr. Lucente: Your Honor, I don't recall the nature of Mr. Youngdahl's objections to Mr. Greer's exhibits. If I remember correctly it was largely a speech about what he considered the weight of the exhibits. I have no exhibits to the exhibits.

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Redirect Examination,

By Mr. Youngdahl:

Q. Mr. Homer, has there been a political difference of opinion between the Brotherhood of Locomotive Engineers

and the [834] Brotherhood of Locomotive Firemen and Enginemen over the last few years? A. Yes, there has.

Q. Approximately when did that political difference begin? A. It began after the death of Former Grand Chief Engineer Roy Davidson when he was succeeded by Mr. Perry Heath, the present encumbent of that position.

Q. Is that the Mr. Heath about whom Mr. Lucente asked you questions today? A. That is right.

Q. And have those two organizations been competing for membership among firemen and engineers all over the country? A. They have.

Q. Mr. Lucente had you read into the record a letter from Mr. Heath and some other material which mentioned among other things $1.50 a day increase in rate for firemen—excuse me, for engineers operating on trains without firemen. Do you recall that? A. Yes, I do.

Q. In any of the railroad cost of compliance submissions to this court, was that $1.50 per day increase for engineers operating without firemen ever mentioned? A. No.

[835] Q. As far as you know, was it taken into account in any way in any of the cost of compliance material submitted by the plaintiff? A. As far as I know, it was not.

Q. Why did you select the Kansas City Southern Railroad as a basis for your cost of compliance analysis? A. Only because it was the only railroad which provided——

Mr. Youngdahl: Just a minute, Mr. Homer.

Judge Miller: I think he went into that pretty thoroughly.

Judge Henley: He said that was the only information he has. That is why he did it.

Mr. Youngdahl: Fine. If the record is clear.

Judge Miller: It is perfectly clear.

Q. Would you refer again to Plaintiffs' Exhibit 114, which is the two sheets, introduced through Mr. Greer. My question, Mr. Homer, is this. Which classifications of employees have the highest incident of casualties just gen-

erally? A. Well, in general terms, the freight and yard brakemen, the yard brakemen in particular have the highest rate usually.

Q. The point has been made about the effect on the mix when firemen are taken off because firemen have a low [836] incident. Would it also have an effect on a mix a compensating effect to the years 1964 and 1965 as brakemen are taken off? A. Yes.

Mr. Youngdahl: That is all I have.

Mr. Lessenberry: I would like for the record to show that the defendants did not care to question.

Judge Van Oosterhout: Very well. The State has no cross-examination. Is there any further testimony on the part of the Intervenor. I think the defendant has already rested.

Mr. Ross: The Intervenors rest.

Judge Van Oosterhout: Is there any rebuttal evidence?

Mr. Light: I have one rebuttal witness.

* * * *

[897] **JOHN G. GERMAN,**

being called to the witness stand on rebuttal, on the part of the Plaintiffs, after being duly sworn, testifies as follows:

Direct Examination,

By Mr. Light:

Q. Your name is John G. German? A. Yes, sir.

Q. Where do you live, Mr. German? A. 668 Applewood Drive, Kirkwood, Missouri.

Q. Mr. German, your background and qualifications were spelled out in detail in your testimony filed in this case, which is PX-22, and therefore I will not take the Court's time to again go through your technical qualifications and experience, but just briefly to identify you, have you a degree from any educational institutions? A. Yes,

sir, I have a Bachelor of Science degree in Mechanical Engineering.

Q. From what institution? A. Case Institute of Applied Science at Cleveland, Ohio.

Q. How long have you been engaged in the mechanical end of the railroad industry? A. In continuous service since late 1943.

Q. Mr. German, we have heard much about the alarms that [838] are sounded on a diesel locomotive. When an alarm is sounded on a diesel, sounded or indicated, what does this mean? A. It means that there has been a malfunction or potential malfunction somewhere in the locomotive consist.

Q. Does it indicate that that unit affected has done anything, or has anything occurred on that unit affected? A. Yes, it does. In practically all instances the unit has taken itself off the line or killed itself.

Q. What are the alarms that sound on the diesel units in common use today, including those used on your railroad company? A. Low oil line which gives an amber light, a bell. And there is an indication that there either is a sudden drop in oil pressure, or more commonly that the engine has shut itself down for some reason.

Q. What is another alarm? A. No voltage relay, which is a blue or purple light, which indicates that there is a loss of alternating current for the cooling fans and blowers, usually caused by one of three fuses in the auxiliary generator or alternater circuit blowing. Or it is another indication that the unit has killed itself for some other reason.

Q. What is another alarm? [839] A. The ground relay alarm on the later units is a white light and a bell, which indicates that there has been a surge of current to ground, what might be termed a short circuit, and the unit has isolated itself, unloaded itself.

Q. Mr. German, with respect to the three alarms that

you have just described, are diesel units so manufactured that when the alarm goes off the unit automatically shuts off power in it? A. Yes, sir.

Q. What would happen with respect to those three alarms if the alarm were merely ignored and the train proceeded on in to the terminal? A. Nothing would happen.

Q. Now, is another alarm the hot engine alarm? A. Yes, sir.

Q. How is that indicated? A. That is a red light and alarm bell, and the bell will persist in ringing and the light will persist in staying lit until the cooling water system has dropped back to value to cut off the relay.

Q. What would be the results in the event of a hot engine alarm if it were ignored and the train continued on the road? A. If the hot engine alarm were ignored, no action taken [840] whatsoever, and the load continued on that engine, there is a possibility that the engine would get so hot it would blow out the water and lose lubrication and cause damage to the engine.

Q. What is required of a member of the train crew to properly attend to a hot engine alarm? A. The unit in trouble would give an indication by its red light, and that unit must be checked for cooling water level and temperature and cooled down as necessary, usually by taking some or all of the load off of it.

Q. How many men does it require to attend to these chores you have described with respect to the hot engine alaram? A. One man.

Q. How many men does it take to attend to whatever chores might be done in connection with the other three alarms, Mr. German? A. One man.

Q. Does your railroad have a rule concerning passing between moving lecomotive units? A. Yes, sir.

Q. What is the rule? A. Well, the rule is contained in the special instructions of the time table. I think a good

example would be that which is shown in the Southern District time table number 4 effective 12:01 a. m. Sunday, November 27, 1966.

[841] Q. Is that the time table effective on the district that Mr. Shephard is general manager of and he has described? A. Yes, sir. The specific instruction is on page 31, item 14, special instructions relating to operation of diesel engines, paragraph 7, "coupling road switch diesel units to standard road diesel units: employees must not pass from one unit to another while units are in motion, except between 'A' units coupled back to back, 'B' units, and between rear of 'A' units and adjoining 'B' units."

Q. Would you describe what sort of access between units is available in the situations that are excepted from that rule? A. The rule—I beg your pardon, sir.

Q. There are certain situations that the rule excepts. Is that correct? A. Yes, the rule permits passage between certain units.

Q. In those instances where it permits passage, I would like for you to describe the type of access between units that is available to a person passing between the units. A. Those are the units known as car body units built very similar to a passenger car in that they have end doors on the back end of the "A" unit and both ends of the "B" unit, and they afford a good passageway between units.

[842] Q. This is an interior passageway? A. Yes, sir.

Q. Similar to passing between adjacent passenger cars on a passenger train? A. Yes.

Q. Did you hear Mr. Pelton's testimony that this rule was ignored by certain operating employees? A. Yes, sir.

Q. What is your observation in that regard? A. I haven't seen this done in recent years. I certainly don't condone violating the rules.

Q. What is your position with the railroad company, Mr. German? A. Assistant Vice President, Engineering.

Q. This is not the same position you held at the time your testimony was prepared. Is that correct? A. No, sir, I was Chief Mechanical Officer at that time.

Q. What is the difference in the duties that you now have from those you then had? A. Well, in addition to having charge of the maintenance of equipment or mechanical department, I now also have charge of the maintenance of way department, including bridges, signals, communications.

Q. As Assistant Vice President of Missouri Pacific Railroad Company, are you in a position to tell the Court whether [843] the company is serious about the enforcement of this rule? A. Yes, sir, we are.

Q. Mr. German, what malfunction occurs, if any, on diesel locomotives that can be located or detected only when the unit is under load? Would you describe what under load means preparatory to answering that? A. Well, first, under load means that the unit is generating power to the motors in pulling. And when it is isolated it is called off the line or off load. And sometimes a unit will drop its load, as one of the gentlemen described yesterday, in which case you can detect it by loss of power, the momentum of your train.

Q. Is this something that the engineer can feel very easily sitting and running the train? A. Yes, he can detect it by feel or decrease of speed.

Q. If there were occasion for him to want to locate which unit was affected with this malfunction, how could he do that by himself? A. Well, first, if it was impairing his movement to the point that he couldn't proceed, he could stop the train, and then he could isolate all the leading units and take the battery field fuse off the last unit, set the brakes, open the throttle one or two notches on the lead control unit, and make a sequence check to see if his unit [844] was coming on the line properly or not.

Q. What if it turned out that it was not the last unit affected? A. Then he could leave that unit isolated and check the next unit, work his way toward the lead cab.

Q. Is such type of checking done by the mechanical forces on any occasion? A. Yes, sir, this is how a trouble-shooter sequence checks.

Q. Mr. German, is there any malfunction that occurs in the diesel locomotive that can be repaired or corrected by members of the train crew out on the road that requires the services of more than one man? A. No, if he can repair at all, one man can do it.

Q. What mechanical or electrical training do firemen receive? A. Very rudimentary in their promotion examinations and they are exposed to terminology as to how traction motors are connected to the main generator, the term "transition" and so forth that you heard yesterday, but they are not given extensive training in making repairs. In fact, they are given no training in making repairs other than changing fuses and resetting circuit breakers and safety devices.

Q. As chief mechanical officer of the Missouri Pacific, do you want or expect these firemen to be making mechanical [845] or electrical adjustments on these diesel locomotives? A. No, the adjustments, particularly in the electrical areas, and more so in the past ten or twelve years, require instrumentation and intimate knowledge of the wiring of that particular class of power. And we know from bitter experience that tinkeritis, attempting to correct what the crew thinks is a malfunction, can cause sometimes more damage or more delay than he would have by just isolating the unit and proceeding in regular order.

Q. Does your railroad, and do other American railroads, employ any personnel who are trained in this sort of work? A. Yes, sir, we do.

Q. Who are they? A. Mechanics and particularly electricians and machinists.

Q. What training do they have? A. They serve a four year apprenticeship in which they are given extensive training in their craft.

Q. Mr. German, have you called to my attention that there is a typographical error at page 15 of your testimony? A. Yes, sir.

Q. This is Plaintiffs' Exhibit 22? A. Down in the last answer on page 15; let me read it as [846] it should be read: "My exhibit at page 73 'diesel operation by major railroads in Arkansas' Item A, shows that the Missouri Pacific at the time the exhibit was made owned 660——

Q. Mr. German, what page are you referring to? A. Page 15, sir.

Q. I have incorrectly identified it. This is the deposition that was taken and filed as cross-examination of you by the Intervenors? A. Yes, sir.

Q. And is identified as IRX-22? A. That is right.

Q. All right. You are at page 15 of that document? A. Yes, sir.

Q. Would you now read the sentence as it correctly should appear? A. Going back to the third line of my answer, "the time the exhibit was made owned 660" insert the word "and" "1,000 horsepower Alco yard switchers."

Q. Do those corrections make the exhibit read correctly? A. Yes, sir.

Judge Henley: Is that one 1,000 horsepower?

A. No, sir. It is 1,000, sir. It should be the figure 1,000, and the other figure should be 660.

[847] Judge Henley: And 1,000 horsepower what?

A. Alco, A-l-c-o, referring to the horsepower of the unit, not the numbers of the units as it originally read.

Q. Mr. German, do you receive any sort of reports that are regularly prepared and submitted to you in your official position that would permit you to evaluate the performance of engineers on trains without firemen in

the states where that is permitted? A. I receive the Daily Delay Report every morning covering the preceding 24 hours, which indicates delays to all trains for any reason in excess of five minutes or more.

Q. Does this cover the Missouri Pacific system? A. Yes, sir. And this report shows the reasons for the various delays encountered by trains, for example.

Mr. Ross: Your Honor, I don't believe this is proper rebuttal testimony, and we object to it.

Mr. Light: Your Honor, it is directed to the testimony of the Intervenors filed in this case that an engineer needs a fireman to correct these malfunctions if this is necessary. Mr. Pelton so testified and there was some thirty-four intervenors' witnesses testified.

Judge Van Oosterhout: Is this testimony going to be relatively brief?

Mr. Light: Very brief.

[848] Judge Van Oosterhout: The ruling will be reserved.

Q. Mr. German, on the average (strike)—How many delays per month was the average for 1965 for the Missouri Pacific system because of some malfunction or alarm on diesel locomotives? A. From the daily reports the average 36.7 delays or failures.

Q. Per month? A. Per month, yes, sir.

Q. It was slightly over one a day? A. Yes, sir.

Q. That is for the entire system? A. For the Missouri Pacific.

Q. How many locomotives were you operating in 1965? A. At the end of the year count, something like 739 units.

Q. About how many of these on the average day would have been in operation? A. Between 710 to 720.

Q. Have you observed any difference in the length or character or result of delays in the, with the trains that did not have firemen on them? A. No, I can't say that I have.

Q. Have you looked for it? A. Yes, sir, I sure have.

Q. Would you compare for the Court, Mr. German, your personal [849] observations wth regard to any difference in the affect of the visibility of enginemen of smoke from diesel locomotives and smoke from steam locomotives A. Well, I have made many trips on both, of all styles and kinds, and there is no doubt in my mind that often times the visibility of enginmen on either, or even sometimes both sides of the cab, was impaired by smoke and steam. It is quite dense, and often times when I got to the end of the run I would be filthy dirty. On diesel locomotives even with the engine preceding the cab as they would be in long hood forward movements, I have never had visibility impaired to the point that there would be, that I couldn't see a considerable distance down the track and control the train.

Mr. Light: Your Honor, please, at the time Mr. German's deposition was taken in St. Louis by Mr. Ross, during the re-direct examination I inquired of Mr. German at some length over Mr. Ross' objection that the materials that I was then examining him over were not included in either the direct testimony or the cross-examination, and therefore that this was improper examination. I think Mr. Ross' objection at that time was well taken under the stipulation pursuant to which we were taking the testimony of these witnesses. I am now prepared to [850] question Mr. German over that same material unless Mr. Ross is prepared to waive his objection that he made at St. Louis. In which event, the Court can simply read that interrogation which is already in the record.

Mr. Ross: Your Honor, at the time, as Mr. Light says, I agreed it was not proper rebuttal at that time. I feel at this time it is still not proper rebuttal. However, to save time, I have no objection to allowing the testimony of Mr. German as reflected in his deposition to go into the record.

Mr. Light: I appreciate Mr. Ross' assistance.

Mr. Lessenberry: We offer no objection.

Cross-Examination,

By Mr. Ross:

Q. You do agree with the testimony you have heard here that when an alarm sounds, the lights to which you referred light up in only the unit which is affected? A. Yes, sir.

Q. So unless it is the lead unit of the locomotive which is affected by the alarm the engineer will not know the cause of that alarm. Is that correct? A. That is true, yes.

Q. I believe I understood you to indicate the first three alarms that you mentioned, the low oil alarm, the no voltage [851] relay, the ground relay action, that if those alarms sounded the engineer could continue on his trip without taking any action. Is this correct? A. I said that the engine or unit would have shut itself down, or isolated itself, and would cause no further damage.

Q. Nevertheless, the engineer would, in the absence of a fireman, have to stop and go back (Strike)—Nevertheless, if the alarm were not on the lead unit, or the malfunction for which the alarm indicates was not on the lead unit, the engineer would have to stop the train and go back to determine the cause of the alarm, would he not? A. That is the only way he can determine what caused the alarm and silence the bell.

Q. Would it be necessary for him to stop the train on each alarm? A. Well, certainly. He couldn't go back until he did.

Q. Would it be necessary for him to go back on each occasion? A. I would say yes, because he doesn't know the reason for the alarm, and I stated before, if it was a hot engine alarm and persisted unattended it could cause damage on those units not equipped with a low water alarm.

Q. Thank you. Mr. German, are you aware that all the plaintiff railroads in this litigation did not have a similar rule [852] that the Missouri Pacific prohibiting engine-

men moving between locomotives of a general purpose type? A. I don't know what the other roads have in relation to specific.

Q. Mr. German, you mentioned a test that could be performed by the engineer to determine the engine affected when he believed there is a loss of power on one of the engines. How long would that test take on each locomotive? A. It would depend upon the man and if he had good luck in finding his trouble on the first unit, or if it happened to be on a different unit.

Q. I am asking you about the time to check one unit, Mr. German, whether he could find that that is the unit or not. A. It might take approximately ten minutes.

Q. And ten minutes for each unit thereafter until he located the trouble? A. It would probably be less for the other units, because you have all the units already isolated and controls positioned and so forth.

Q. How does that differ from the test he performs on the first unit on which he performs the test? A. Let's assume that he had four units to start with. He knows it isn't on the first unit or he would have seen the [853] drop of power on his load meter. So he eliminated that unit immediately. It may be in one of the other three units. So he isolates the first three units and sequence tests the last unit. If that sequence test indicates that unit is loading, he isolates that unit, pulls the battery fuse field on the third unit and puts it on the line and sequence tests that one, and so forth progressively until he gets to the second unit.

Q. Are you saying now that it wouldn't take him ten minutes to check each unit? A. I said it would take about ten minutes on the first unit, and it would take relatively less on the next two units.

Q. How much less? A. It depends on what he runs into. It might just be a few minutes and it might be five or eight minutes.

Q. Mr. German, do engineers receive special instructions in electrical and mechanical functions and equipment of a diesel locomotive? A. The engineers have our instructions on diesel electric locomotives, and they know how to position the various controls and reset the various protective devices.

Q. Do you know, Mr. German, how many firemen working for the Missouri Pacific Railroad Company are in fact qualified and promoted engineers? [854] A. I don't know the exact number, Mr. Ross. I would say that considerable number of firemen are promoted qualified locomotive engineers.

Q. Those who are would have the same training as the person operating the train as an engineer? A. Yes, sir, just not as many years of service.

Q. Mr. German, how long (Strike)—What length delays have to be reported by the conductor? A. Five minutes or more.

Q. Pardon? A. Five minutes or more.

Q. Did I hear you correctly when you said that for 1966 the average number of delays per month was 36.7? A. Yes.

Mr. Light: Your Honor, I believe Mr. German testified that was for the year 1965.

A. 1965, yes.

Q. Have you had an opportunity to examine Plaintiff's Exhibits 1 through 17? A. No, sir.

Q. Particularly Exhibits 15, 16 and 17? A. No, sir.

Q. Have you counted the number of delays and the number of days covered by those exhibits? [855] A. No, sir.

Q. Mr. German, is there any light indication in the cab indicating a malfunction which requires the train to stop and two men to perform a test to ascertain the malfunction? A. No, sir.

Q. Is there a wheel slipped indication light in the cabs of most of the locomotives? A. Yes, sir.

Q. What is required when that light blinks regularly on your railroad? A. When the wheel slip light blinks regularly?

Q. Yes. A. If it persists they have to stop and find out which unit is doing it.

Q. How do you do that, Mr. German? A. Well, you can isolate the unit and proceed, and if the blinking is stopped, that one was the one causing the activity, but in that instance I will have to say this. That the wheels should be rolled by someone to make sure they are turning.

Q. Who rolls the wheels, Mr. German? A. Anyone that is convenient.

Q. Do the wheels have to be rolled by the engineer? [856] A. No, he would be operating the locomotive.

Q. What do you mean rolling the wheels? A. Move the unit slowly to see that the wheel is not slipping or sliding.

Q. That is usually done by the engineer, isn't it? A. He moves the unit.

Q. And when he moves the unit the wheels move, too? A. Why certainly, but he has to move them. I just said he would have to move them by somebody. It is called rolling the train or rolling the wheels.

Q. And I believe I just asked you who moved them, and if it is the engineer. A. Well, the engineer moves the locomotive, yes.

Q. Now, somebody has to observe? A. That is right.

Q. The wheels then to see whether or not they are slipping? A. That is right.

* * * *

Further Cross-Examination,

By Mr. Lessenberry:

Q. Mr. German, I think you said if a unit in a multiple loaded unit consist were to stop that you would simply proceed to the terminal. Is this correct? [857] A. I didn't understand you.

Q. I believe that during your direct examination by Mr. Light you stated that if one of the units in a multiple or power consist were to stop and fail to produce power for some reason, that the engineer might just proceed to the terminal with this particular unit dead or not pulling its load. Is that correct? A. Yes, sir.

Q. Is the power to weight ratio on a train such that the train might operate without the use of one of these units?

A. It depends upon the terrain, the size of the train and the consist of units assigned to the train.

Q. All of those things is considered at the time that the number of motive units are assigned to the particular train, is it not? A. Yes, to a certain extent. Of course, there are times when we have more than sufficient units. There are other times when the number of unts to the weight of the train is measured for specific terrain, and is just the right power consist. If under that condition you lost that unit, or lost a unit, and you had full tonnage for say four units, you lost one, you would reduce tonnage for the unit you lost.

Q. You would either take part of the train down to the siding [858] and leave it there, and then proceed what you could? A. You could either double the hill, if that was the case, or you could reduce the tonnage and the following train pick it up.

Q. I guess conceivably that the engineer might find himself in a place where he could not even though because of grades on either side of him he couldn't move the whole train out of there or would have some difficulty, would he not? A. If he couldn't handle it with the remaining units he would either have to double the hill, that is, take part of the train over the hill, and come back for the remainder, or he would have to set off part of it at the next siding. As long as he has one unit operative he can always do something. This has been historical since locomotives were first invented.

Q. With regard to assigning the power to a particular train, do you ordinarily assign more power than is needed, or do you try to reach the point that you are making the most efficient operation of your power? A. We try to use our power as efficiently as possible. The locomotives are costly; they are not bought at the dime store, and we don't like to waste it.

* * * *

[859] Judge Van Oosterhout: Anything more, Mr. Light.

Mr. Light: No, sir. Plaintiff rests.

* * * *

Judge Van Oosterhout: The evidence in the case now is closed.

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SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1967

NO. 950

BROTHERHOOD OF LOCOMOTIVE FIREMEN & ENGINEMEN, ET AL., Appellants,

vs.

CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD COMPANY, ET AL.

NO. 973

ROBERT N. HARDIN, PROSECUTING ATTORNEY FOR THE SEVENTH JUDICIAL CIRCUIT OF ARKANSAS, ETC., ET AL., Appellants,

vs.

CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD COMPANY, ET AL.

APPEALS FROM THE UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF ARKANSAS

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VOLUME II—EXHIBITS.

PLAINTIFFS' EXHIBIT NO. 1—
Testimony of Jack M. Spurr.

My name is Jack M. Spurr. I am employed by the Missouri Pacific Railroad Company as Road Foreman of Engines with headquarters at Little Rock, Arkansas.

I was first employed by the Missouri Pacific in August of 1942 at the St. Louis Terminal as a machinist apprentice. In October of 1942 I became an Electrician apprentice at the same terminal, and after a period of service with the United States Navy from 1944 to 1945, I returned to service with the Missouri Pacific as an Electrician apprentice at the St. Louis Terminal. I became a full Electrician on June 12, 1947, and served in that capacity at the St. Louis Terminal until May of 1955 when I was promoted to the position of Foreman. In 1958 I was promoted to the position of General Foreman with headquarters at Poplar Bluff, Missouri. I became Road Foreman of Engines on the Louisiana Division with headquarters at Wynne, Arkansas, on February 1, 1959. On August 1, 1961, I was promoted to the position of Supervisor of Diesel Equipment at Kansas City, Missouri, and on January 1, 1962, I was transferred to Little Rock, Arkansas as Road Foreman of Engines.

The position which I now occupy, Road Foreman of Engines on the Arkansas Division, requires constant association with and responsibility for the work of Engine Crews on that division. My duties as such are to ride the locomotives and supervise the work of engine crews, to insure that they understand and comply with the Operating Instructions, the Uniform Code of Operating Rules, and know and exercise proper technique of train handling. I also make frequent observations from the ground out on

the road to determine whether the engine crew is complying with such duties as displaying the headlight, operating at proper speed, and sounding the whistle at grade crossings.

In the performance of these duties, I ride an average of six trains per week and these include through freights, local freights and passenger trains. I know how to operate a diesel electric locomotive, and how to handle the engine malfunctions and alarms that occur on such a locomotive, and have had considerable experience doing these things.

In June of 1966 I participated in a study of operations in freight and yard services on the Missouri Pacific Lines. The purpose of the study was to compile information with respect to operations with and without fireman in freight service and with train crews consisting of a conductor and three brakemen and a conductor and two brakemen. I was instructed to ride in the cab of the locomotives on certain freight trains and to observe and take notes regarding the activities of the firemen on such trains. I also was instructed to compile information regarding certain characteristics of these train movements. The information which I obtained has been summarized and appears in Exhibit PX 15 entitled ANALYSIS OF ROAD FREIGHT RUNS, MISSOURI PACIFIC RAILROAD COMPANY. The portions of the Exhibit relating to the runs which I observed carry my name as the observer in Column 16.

I made five observation trips in freight service, on the days of June 6, 7, 8, 10, and 11. Three of the trips were on a local freight run operating out of Gurdon, Arkansas, on a turn-around basis. These three trips are shown in Exhibit PX 15 as the first three entries. Two other trips on which I rode as an observer operated on a turn-around basis from North Little Rock, Arkansas, and from Malvern, Arkansas.

My observations of the activities of the firemen on these trips did not disclose any contributions made by firemen

to the safety of the operations involved. Much of the time of the firemen on these trips was spent performing what is called the lookout function, that is, sitting in the seat on the left hand side of the locomotive observing signals and calling out the signals to the Engineer. This same function is performed by the head brakeman on the trains covered by my observation trips. On the basis of my experience as a Road Foreman of Engines, and the observation trips to which I have referred, I know that this function can be performed adequately by the head brakeman without the assistance of the fireman. On many local freight runs comparable in all respects to those covered by my observation trips, firemen are not used on the Missouri Pacific as a result of the Award of Arbitration Board No. 282. The absence of the firemen from such trains does not present any problems insofar as safety of operations is concerned.

On one of the trips on which I rode as an observer one of the units developed a mechanical difficulty described in the Exhibit as transition trouble. Due to this, we were experiencing excessive wheel slippage on a hill. To eliminate this, the firemen blocked a relay which consisted of holding the relay plunger in with a flag stick during the time we were climbing the hill. If this had occurred with no fireman on the train, then some other crew member in the locomotive could have taken the same action that the fireman did in this instance. If there were no other crew member on the locomotive, the engineer would have stopped the train (in fact, the train would have stopped without any action on the part of the engineer) and made a relatively minor adjustment to correct this trouble.

The remainder of the fireman's time was devoted primarily to passing hand signals from the train crew to the engineer while switching was being performed at certain of the stops made by the trains. This activity by the fireman is also unnecessary and does not contribute to safety

of operations. The preferable practice is for the members of the ground crew to station themselves in such a manner as to be able to pass the signals directly to the engineer. Since the engineer is the employee who must act on the basis of the signals thus transmitted, it is a safer practice to transmit the signals directly to him instead of using the fireman as an intermediary. This is the manner in which signal passing is handled on the runs in local freight service in other states where we do not use firemen.

During my railroad experience I have had many occasions to observe that members of train crews with as many as six men have much idle time on their hands because the work to be performed can be done by fewer men. For example, I observed a brakeman on the second diesel unit asleep at Abco on a run from El Dorado to North Little Rock about two months ago. I have ridden on many through freight trains with an engineer, fireman and two brakemen on the diesel units where the non-stop trip was made without any crewman getting out of his seat except for a brakeman getting up occasionally to inspect his train on a curve. Of course, the train can be inspected on a curve by a person seated in either the engineer's or fireman's seat, depending on whether it is a left or right curve.

During June of 1966 I also observed the activities of firemen on a number of yard assignments. I have not summarized my observations regarding yard service, but can state generally that the activities of firemen on diesel locomotives in yard service are unnecessary insofar as safety of operations is concerned. The assignments which I observed operated in the Missouri Pacific yards at Little Rock. One of the assignments involved an engine crew without a fireman. The other assignment involved engine crews in which a fireman was employed. The absence of a fireman from the crew operating only with an engineer in the locomotive did not create any safety problems.

INTERVENORS' REBUTTAL EXHIBIT NO. 1—
Cross-Examination,

By Mr. Ross:

Q. State your name and address, please, sir? A. Jack M. Spurr, 11114 Birchwood Drive, Little Rock, Arkansas.

Q. What is your educational background, Mr. Spurr? A. I have a two year high school education and a four year electrical apprenticeship with the Missouri Pacific.

Q. Did you graduate from high school? A. No, sir.

Q. You completed what grade? A. The eleventh.

Q. And what year was that? A. That was in 1941.

Q. What employment have you had other than with Missouri Pacific Railroad Company? A. That has been the only employment I have had is with Missouri Pacific Railroad. Of course, I spent some time in the Navy in 1944 and 1945.

Q. Mr. Spurr, who decided to make this study or survey that you refer to in your testimony? A. Who decided to make the survey?

Q. Yes, sir? A. My superintendent had us in his office and told us that we were going to make the survey. He said I was going to check the performance of the engine crew on several trips.

Q. What specific instructions did you receive concerning these runs which you were to make or rather on which you were to ride? A. Well, he instructed me to ride four locals, a traveling switch engine and several switch engines in North Little Rock terminal.

Q. And what specific observations were you to make on these runs? A. To check the performance of the locomotive fireman and engineer.

Q. And this was for the purpose of obtaining information so you could testify on behalf of the carriers in this lawsuit? A. Yes, sir.

Q. Who was your supervisor at that time? A. Mr. H. D. Huffman, the superintendent.

Q. The superintendent or supervisor? A. The superintendent.

Q. Did he tell you which locals to ride? A. Yes, sir.

Q. Do you know how those locals were chosen? A. No, I don't.

Q. Did he tell you which switch engines to ride? A. Yes, sir.

Q. Do you know how those were chosen? A. No, sir, I don't.

Q. Is there more than one traveling switch engine over the territory or on the territory over which you have jurisdiction? A. I don't believe so at this particular time.

Q. Was there at the time you made the survey? A. No. I believe this was the only traveling switch engine.

Q. Who selected the days on which you were to ride on these runs? A. That was left up to me.

Q. And how did you select those dates? A. Well, the four locals that I did ride and the switch engine all originated at Gurdon, Arkansas and I just picked them out at random which ones I would ride.

Q. Where were you headquartered at the time, Mr. Spurr? A. Little Rock, Arkansas.

Q. Have you had any experience as an operating engineman? A. Since I have assumed the duties of a road foreman of engines I have and that was in 1959.

Q. You were never regularly assigned as an engineer or a fireman? A. No, sir.

Q. What experience have you had since you have been road foreman in operating as an engineer or a fireman? A. Well, on a number of occasions I have handled freight trains and passenger trains checking the operation of the equipment on the locomotive.

Q. Are these times that you are referring to times when an engineer and a fireman were both present on the engine? A. Yes, sir, that's right and I have also handled trains during strike, the strike on March 31st I believe it was of last year.

Q. Your experience prior to becoming a supervisory employee was as an electrician? Is that true? A. That's true, yes, sir.

Q. You mention in your statement on Page 2 some of the duties, some of your duties riding locomotives and supervising and instructing the crews and to make sure that the crew, that they understand and comply with the operating instructions, the Uniform Code of Operating Rules and know and exercise proper technique of train handling. Do you know and exercise proper technique of train handling when you are operating a train? A. Yes, sir.

Q. Mr. Spurr, what causes break in two's? A. Break in two's are ordinarily caused from slack action in the train.

Q. And slack action is caused by what? A. Slack action can be caused by improper handling of the train brakes. It can be caused by the make-up of the train consist and it can be caused by the physical characteristics of the railroad.

Q. The latter two can be controlled somewhat by the engineer in the operation of his train, can it not? A. To a certain extent, yes, sir.

Q. Have you ever had an experience to break in two while operating as an engineer? A. Not while braking or handling the brake valve running. I have had in starting a train.

Q. Where was that? A. This was at Hope, Arkansas.

Q. And that was during the strike of March or April of 1966? A. Yes, sir.

Q. That you referred to earlier? A. Yes, sir.

Q. Did you experience more than one break in two? A. at the same time?

Q. Did you have two break in two's in Hope during the strike? A. Yes, sir, we had two.

Q. While you were operating as engineer? A. Yes, sir.

Q. Mr. Spurr, in your statement on Page 3 at the bottom of the page and at the top of Page 4 you refer to your observations of the activities of the firemen on these trips that you made and state that "they did not disclose any contributions made by the firemen to the safety of the operations involved". You go on to say and I am paraphrasing that "much of the fireman's time was consumed performing the lookout function". Is this not a contribution to the safe operation of the train? A. Yes, sir, it could be.

Q. You are familiar with Rule 34-A of the Uniform Code of Operating Rules which requires firemen when practicable to keep a constant and vigilant lookout? A. Yes.

Q. Anyone performing the lookout function contributes to the safe operation of the train, don't they, Mr. Spurr? A. Anyone, yes, sir.

Q. Have you ever operated a train outside of Arkansas as an engineer or fireman? A. No, sir.

Q. Have you ridden on any trains, on the head end of any trains operating outside of Arkansas? A. Yes, sir.

Q. When did you do that? A. In 1961 I was working out of Kansas City as supervisor of diesel equipment.

Q. Have you ridden on any trains outside of Arkansas since the beginning of 1964? A. No, sir, I don't believe so.

Q. Mr. Spurr, I refer you to your statement on Page 4, about the middle of the first paragraph at the top of the page "On many local freights comparable in all respect to those covered by my observation trips, firemen are not used on the Missouri Pacific as a result of the award of Arbitration Board No. 282. The absence of the firemen from such trains does not present any problems insofar as safety of operations is concerned". Now, you have just said you haven't ridden on any of these trains and so you don't have any first hand knowledge on which to base that statement, do you? A. No, sir, I don't.

Q. Mr. Spurr, in the next paragraph on Page 4 you refer to an incident in which the fireman blocked a relay. How many engines were on this, how many engines made up the engine consist of this train? A. Two.

Q. What type engines? A. They were GP type, all purpose engines, E. M. D. locomotives.

Q. Which engine experienced the relay trouble? A. That was the lead unit and I don't have the engine number with me on that.

Q. What is the relatively minor adjustment that you refer to that the fireman made? Pardon me. Let me rephrase that. I believe your words were that "In the absence of the fireman, the engineer could have stopped the train and made a relatively minor adjustment to correct this trouble." What was that relatively minor adjustment that you refer to? A. The only adjustment that could have been made would have been the blocking in of the relay for the engineer to perform. As far as correcting the transition trouble due to an adjustment, this would have to be performed by a shop craft.

Q. Mr. Spurr, in the next paragraph, no, let me continue with this. At the time this malfunction occurred and the fireman blocked the relay as you say, how many cars was the train pulling? A. I really couldn't state how many cars we had in our train at that time.

Q. Was it a—— A. I wasn't interested too mnch in the number of cars as I was paying more attention to the engine crews than I was the train crew or the train consist.

Q. The number of cars that the engines are pulling has some bearing on the operation of the train, though, doesn't it? A. Oh, yes, sir.

Q. Was this a tonnage train? A. Yes, this was a tonnage train.

Q. What kind of hill was this you were pulling at the time? A. Well——

Q. What grade? A. I couldn't tell you exactly what the grade was on this hill but I would guess that it was close to one percent ascending grade.

Q. And by "tonnage train" is it your understanding that a tonnage train is a train that is loaded to the capacity of the engines pulling the train? A. To the pulling capacity of them, yes.

Q. Had the engineer stopped this train on the hill to perform the repair work or to remedy this situation, could he have started this train up again on this hill pulling the full train? A. I don't believe he would have started it on this hill, no, sir, if he had came to a complete stop.

Q. He would have had to have double part of the train or back the train back down the hill to get another start? A. That's true, yes, sir.

Q. And by "double" we mean cutting off part of the cars and taking them to the next available siding or track and then returning for the remainder of the cars? A. That's true, yes, sir.

Q. Now, let's go to the next paragraph. You referred to the fireman's time "the remainder of the fireman's time was devoted primarily to passing hand signals from the train crew to the engineer while switching was performed". And then you make the statement "This activity by the fireman is also unnecessary and does not contribute to safety of operations." Now, I believe Rule 34-A requires him to pass signals, does it not? A. Let me read that. It says "He will keep a constant and vigilant lookout for signals or for any condition that might affect the movement of the train or engine". Yes, sir.

Q. That would include signals from members of the crew, would it not? A. Any signals, yes, sir.

Q. And then in the next paragraph on Page 5 you mention an occasion when you observed a brakeman on the second diesel unit that was asleep. Was this while

the train was running? A. The train was stopping at this location to pick up cars.

Q. Was this brakeman on duty at the time? A. Yes, sir.

Q. He wasn't deadheading? A. No, sir.

Q. Did you report this conduct to your superiors? A. No, sir. The trainmaster and myself were at this particular location and, after the stop was made, the trainmaster went up on the unit to handle with this brakeman and I went to the head end where the engineer and fireman were on the lead unit.

Q. Was any disciplinary action taken against this brakeman? A. No, sir, it was handled there on the ground.

Q. Your railroad company, the Missouri Pacific Railroad Company I would assume has a rule against members of the train crew sleeping while they are on duty? A. Would you repeat that question?

Q. Does your company have any rule concerning employees sleeping while on duty? A. Oh, yes, sir.

Q. And what is that rule? Mr. Spurr, you need not find the specific rule. Just tell me what your understanding of the rule is if you have one? A. Employees are not permitted to sleep while on duty.

Q. What are some of these trains that you have ridden, these through freight trains, would their crew consist of an engineer, fireman, two brakemen on the diesel unit on non-stop trips where didn't anybody get out of their seat except for a brakeman to go from one side of the locomotive to another for the purpose of looking out? A. I made several trips on train 61 between North Little Rock and Texarkana.

Q. What dates were those trips made? A. I can't give you any certain date on it.

Q. How long did the trips take from the beginning point to the termination point? A. Ordinarily they will take from two hours and fifty minutes to three hours.

Q. Did any of these trips take any longer than that? A. Not ordinarily a long non-stop trip, it would not be much over three hours if it is over three hours, possibly three hours and five minutes at times.

Q. And it is your testimony then that no member, none of these four members of the crew other than a brakeman got out of their seat during that time for any purpose? A. I wouldn't say that none of them got out of their seat at any time for any purpose.

Q. Isn't that what this paragraph says or am I reading it wrong? Do you see the part I am referring to, Mr. Spurr? It is on Page 5. A. Yes, sir. What I meant by that was that no one got up to perform any other duties other than inspect the train.

Q. That is not what this paragraph says, is it?

Mr. Light: Let him finish his answer.

Mr. Ross: I thought he was through. I am sorry. Go ahead, Mr. Spurr.

The Witness: That was all I had just no one——

By Mr. Ross: Q. You are through with that answer then? A. Yes, sir.

Q. All right, that is not what this paragraph says though, is it? A. No, sir.

Q. Mr. Spurr, at the bottom of that page and at the top of the next page you refer to the activities of the firemen on a number of yard assignments and you say that "I have not summarized my observations regarding yard service but can state generally that the activities of firemen on diesel locomotives in yard service are unnecessary insofar as safety of operations is concerned". Now, are you saying that they are never necessary insofar as safety of operations is concerned? A. Yes, sir.

Q. That is your statement? A. Yes, sir.

Q. Then, there is really no reason for "generally" to be in there then, is there? A. No, sir, I don't see that it would be necessary for "generally" to be in there.

Q. Is this a change of opinion on your part since you executed this statement or is that just a mistake to have that word in there? A. No, it is not a change in my opinion.

Q. On the next page, Mr. Spurr, you mentioned two different assignments in yard service I believe you are referring to. What was the nature of the work performed by the engine crew operating without a fireman? A. This was on a crest engine, hump engine in North Little Rock.

Q. A hump engine? A. Yes, sir, a hump engine in North Little Rock, both jobs.

Q. Is this engine operated within the confines of the North Little Rock hump yard? A. Yes, sir.

Q. The other assignment that you refer to—I am not clear as to whether it was one or more assignments but you say it involves engine crews in which the fireman was employed. What was the nature of the operations, switching operations performed by that engine crew or crews? A. This was what we call the N. I. A. job.

Q. This job does industrial switching in the new industrial area outside of Little Rock? A. That's true, yes, sir.

Q. So these two different crews performed different types of operations, don't they? A. Yes, sir.

* * * *

Redirect Examination,

By Mr. Lucente:

Q. Mr. Spurr, how many cars does this N. I. A. job usually handle? A. I would say ordinarily around thirty cars, twenty-five to thirty cars. That would be heavy.

Q. What size cuts does the hump engine handle shoving to the crest of the hump? A. Well, at times the hump engine will shove as many as a hundred and fifty cars at one cut.

Q. Does it sometimes shove more than one hundred and

fifty cars in one cut? A. It's possible that they could. I wouldn't say for sure.

Q. How does the hump engine accumulate the cars that are shoved in a cut over the hump? A. This is the inbound yard for trains arriving at North Little Rock and the hump engine will shove these trains as they are left in the yard after the air is bled off of them.

Q. Will it build the cuts before they are shoved over the hump? A. The only time they would build a cut or change the cut would be when they drag possibly from one rail and shove against another rail to shove these cuts over.

Q. You worked for a while as diesel supervisor at Kansas City, Missouri, did you not? A. Yes, sir, that's right.

Q. In that capacity did you have occasion to observe the local freight operations in Missouri? A. No, sir. Most of my time was on through freight between Kansas City and Pueblo, Colorado. I rode very few local trains.

Q. Did you ride some local trains in that territory? A. I don't recall ever riding a local, no, sir.

Q. Does a Wendel Chesshir work in the territory over which you have jurisdiction, Mr. Spurr? A. Yes, sir.

Q. Have you examined a statement of Mr. Wendell Chesshir which has been submitted on behalf of the intervenors in these proceedings? A. Yes, sir.

Q. Are you familiar with switching operations performed at Bauxite as referred to by Mr. Chesshir at Page 7 of his statement? A. This local that Mr. Chesshir refers to as the long barrel local does not perform any switching service at Bauxite.

Q. How is the switching at Bauxite to which Mr. Chesshir refers presently performed? A. We have a turn out of North Little Rock, seven thirty eight and seven thirty-nine that does the switching at Bauxite.

Q. Are you familiar with the switching at Benton yards to which Mr. Chesshir refers at Page 9 of his statement?

A. This long barreled local does not do any switching at Benton.

Q. How is the switching at Benton performed now, Mr. Spurr? A. The switching at Benton is performed by a local that originates at Benton and works between Benton, Arkansas and Gurdon.

Q. What is the size of the crew that mans that local? A. This crew has an engineer, fireman, two brakemen and a conductor.

Q. At page 13 of his statement Mr. Chesshir refers switching at Malvern. Is that switching presently performed by the long barrel local to which Mr. Chesshir refers? A. No, sir, the switching is performed by either the local from Benton to Gurdon or the local working from Gurdon to Benton.

Q. How many brakemen are in the crew manning those locals? A. Two brakemen.

Q. At page 16 of his statement, Mr. Chesshir refers to switching at Hope, Arkansas. Is that switching presently performed by the long barrel local to which Mr. Chesshir refers? A. The switching at Hope is performed by a Hope traveling switch engine.

Q. How many brakemen are on the crew manning that switch engine, Mr. Spurr? A. Two brakemen.

Q. Mr. Spurr, you were questioned about a statement appearing in page 5 of your statement on file with the Court with respect to non-stop trips made in through freight service without any crewmen getting out of their seats except for a brakeman getting up occasionally to inspect his train on a curve. In the statement to which I refer as well as other parts of your statement, were you describing the duties performed by crew members?

Mr. Ross: I will object to the question as being leading.

Mr. Lucente: I will rephrase the question.

Q. At that point in your statement, what were you undertaking to describe insofar as the activities of the crew

are concerned? A. I was trying to describe their duties which they had to perform while this train was in route between North Little Rock and Texarkana.

Q. Your reference to the duty which they had to perform, is that a distinction with respect to other activities in which the crew might engage? A. I don't quite understand.

Q. Did the crew also get up from their seats for purposes other than inspecting the train around the curve? A. Yes, sir, they got up.

Q. For what purpose? A. For the purpose of getting a drink of water, might have used the lavatory.

Q. The statement that appears at page 5 or was the statement that appears at page 5 intended to refer to such occasions——

Mr. Ross: Object to the question as being leading.

The Witness: No.

Mr. Lucente: I believe that is all, Mr. Ross.

Recross-Examination,

By Mr. Ross:

Q. Mr. Spurr, the printed words in this paragraph just referred to by Mr. Lucente do not indicate any such intent as you have just described, do they? A. No, sir.

Q. I assume, Mr. Spurr, that you read this statement and that you signed it? A. Yes, sir, I did.

Q. How long has it been, Mr. Spurr, since a long barrel local performed switching at Bauxite? A. These local changes were made the latter part of 1966 I believe, October or possibly November, part of these changes were made.

Q. Which changes—pardon me, go ahead? A. The south bound trip on this long barrel local does not work Bauxite but occasionally the north bound trip of this local may set out some cars at Bauxite and may pick up cars at Bauxite.

Q. Do you know when the changes were made? A. Not the exact date, no, sir, I couldn't say.

Q. What about Benton? How long has it been since the long barrel local referred to by Mr. Chessir in his statement has done any switching at Benton? A. Well, again, I couldn't give you the exact date the local changes were made. They were made at the latter part of 1966.

Q. What about Malvern? A. Well——

Q. When did the long barrel local discontinue its switching at Malvern? A. Again I would have to say approximately October or November of 1966.

Q. And what about Hope? When did the long barrel local discontinue switching operations at Hope? A. The same would apply at Hope.

Q. Was switching discontinued by the long barrel local at Bauxite, Benton, Malvern and Hope all at the same time? A. Not at the same time. I wish I could give you the dates but I just can't give them to you now but approximately the same time.

Q. Within the same month or two? A. Same month or two I would say, yes, sir.

Q. Have you ever ridden on this long barrel local? A. Yes, sir.

Q. When is the last time you rode on it? A. I would say it's been three or four months since I have made a trip all the way with this local; however, I believe it was last month I did ride this local from Hope to Texarkana where it tied up.

Q. Mr. Spurr, are you saying that no switching at Bauxite, Benton, Malvern or Hope has been performed by the long barrel local since October or November of 1966? A. Well, I can't say that no switching has been performed by this local. At times they may have a few switch moves that they want this local to make and he would stop and do them.

Q. This long barrel local is subject to performing switching at any time at any place that the Missouri

Pacific Railroad wants it to; is that right? A. That is correct, yes, sir.

Q. Back to the hump engine operations at North Little Rock which you referred to or one switching assignment on the hump yard, are these hump engines equipped with cab signals? A. Yes, sir.

Q. What are cab signals? A. Cab signals are signals located in the cab of the locomotive that govern the movement of this train or engine.

Q. And the engineer moves his hump engine according to those cab signals, does he not? A. Yes, sir.

Q. The cab signals are located in the engineer's compartment? A. Yes, sir.

Q. Is the N. I. A. switch engine equipped with operating cab signals? A. No, sir.

Q. These hump engines are the only engines that the Missouri Pacific operates in Arkansas that are equipped with operating cab signals; isn't that true? A. That is true, yes, sir.

* * * *

Re-Redirect Examination,

By Mr. Lucente:

Q. Mr. Spurr, when these hump engines are doubling cuts together prior to making the move at the hump or to the crest of the hump, that is, do cab signals control the movements that are being made in the doubling process? A. No, not when they are doubling, no, sir.

Q. How many diesel units are there or how many diesel units are used in these hump engines? A. There are two units.

Q. How many units are used in this N. I. A. switching job? A. One unit.

* * * *

PLAINTIFFS' EXHIBIT NO. 2—Testimony of William A. Wilson.

My name is William A. Wilson. I am employed by the Missouri Pacific Railroad Company as Road Foreman of Engines with headquarters at Van Buren, Arkansas.

I was first employed by the Missouri Pacific in March of 1942 as a Boiler Maker Helper with headquarters in North Little Rock, Arkansas. In November, 1942 I became a Fireman on the Arkansas Division with headquarters in Little Rock. As Fireman, I worked on local freights, through freights and passenger trains as well as in switch service. I served as a Fireman on steam locomotives for six or seven years until we began converting to diesels, and worked on steam locomotives that burned coal as well as those that burned oil. I served as Fireman on hand-fired coal burning locomotives, and in that work about 70 to 80% of my time was devoted to shoveling coal and watching the gauges, with the balance available to perform the lookout function. As locomotives have been improved, the time available to a Fireman to perform the lookout function has progressively increased to the point that almost 100% of his time is now available for that purpose.

I am a former member of the Brotherhood of Locomotive Engineers and also a former member of the Brotherhood of Locomotive Firemen and Enginemen.

In October of 1954 I was promoted to Road Foreman of Engines on the Wichita Division. In March of 1955 I was transferred to the Kansas-Colorado Division with headquarters at Ossowatome, and in August of 1956 was promoted to Assistant Trainmaster with headquarters at Van Buren, Arkansas. I served in that capacity until June of 1958 when I was transferred to Atchison, Kansas, as Assistant Trainmaster.

In October of 1960 I was appointed to the position of

Road Foreman of Engines with headquarters at Van Buren, the position which I now occupy.

As Road Foreman I am responsible for supervision of the engine crews and in the performance of these duties ride an average of about 35 trains per month and I almost invariably occupy the leading power unit. My duties as Road Foreman are summarized in Exhibit A to the testimony of Mr. Lester J. Allen.

I participated in a study of freight operations on the Missouri Pacific in May and June of this year for the purpose of observing the activities of firemen on runs in that class of service and also to observe the operation of freight trains without firemen on portions of the Missouri Pacific outside of the State of Arkansas. My observations covered four runs in freight service between Van Buren and North Little Rock, Arkansas. Data regarding these runs appears in Exhibit PX 15 on the lines on which I am shown as the observer in Column 16. Two of the runs were in local freight service and two were in through freight service. The two runs in local freight service involved no mechanical difficulties and consequently the Fireman on such runs did not perform any mechanical function. On one of these runs, I adjusted a safety valve and the Fireman observed the air pressure gauge for me during this adjustment. If I had not been present, this adjustment would not have been made as the condition I corrected does not affect the operation of the train. Generally, the runs in other respects were the same as those covered by Mr. Spurr's testimony and I agree with his discussion of the absence of any connection between the presence or absence of a Fireman in local freight service and the safety of operations. On one of the trips in through freight service there was a ground relay action on two of the units. This mechanical difficulty required 21 minutes of the fireman's time. A bell sounded in the lead unit indicating a malfunction in one or more of the trailing units. The train was stopped because it is im-

possible on the type of diesel units we had to pass from one unit to the other while the train is in operation, without violating company rules. The fireman examined the trailing units and found that a ground relay had tripped on two of them, and that one of the units was dead. He reset the ground relay on these two units simply by pushing a button on each of them, and pushed the starter button to start the unit which had died. We returned to the lead unit and started the train and had moved only a short distance when another alarm occurred. The train was again stopped and the fireman found that one of these units was again dead with the ground relay tripped. He reset the ground relay, re-started this unit and we again returned to the leading unit and started the train. When an alarm again sounded, the fireman took the unit where the malfunction had repeatedly occurred off the line which simply required turning a switch. We then proceeded without further difficulty.

Had the fireman not been present on this train, the engineer or any other member of the engine crew could have performed this work.

In addition to the observation trips which I have described, I also rode Train No. 101 from Coffeyville, Kansas, through Oklahoma to Van Buren, Arkansas, on May 31, 1966. This leg of the movement of Train No. 101 immediately preceded the trip from Van Buren to North Little Rock to which I have previously referred. On the trip from Coffeyville to Van Buren the train operated without a Fireman to Greenwood Junction, which is approximately six miles short of the train's destination at Van Buren. At that point, the Arkansas State Line, a fireman is taken on because of the requirements of the Arkansas statute. Train No. 101 from Coffeyville to Greenwood Junction involves substantially the same characteristics as the train from Van Buren to North Little Rock. The portion of the movement without firemen involved a locomotive consisting of three units with road

time of five hours, no engine malfunctions, 112 cars, and a distance of 166 miles. Three stops were made by the train for purposes other than setting-out or picking up cars. The head brakeman rode on the lead unit with the engineer just as the head brakeman rides on the locomotive with the engineer when the fireman is present. The movement from Coffeyville to Van Buren was made without any accidents and without any safety problems which could in any way be attributed to the absence of a fireman.

A similar comparison can be made between the trip which I have described between North Little Rock and Van Buren on June 1, 1966, with Train No. 102 and the continuation of that train movement from Van Buren to Coffeyville as shown on Exhibits PX 15 and PX 17. Train No. 102, between North Little Rock and Van Buren, consisted of five units, road time of five hours and fifteen minutes covering a distance of 155 miles. A fireman was present as part of the engine crew. After the departure from Van Buren the fireman was dropped off at Greenwood Junction, some six miles away, and the train proceeded to Coffeyville without him. On this portion of the movement the locomotive consisted of five units, road time was approximately six hours, there were 147 cars in the train, one stop was made for setting-out or picking-up cars and the distance between terminals was 166 miles. The trip from Van Buren to Coffeyville is also of some significance because an engine malfunction developed which required that the unit in question be taken off line. This is comparable to the ground relay action which developed when the fireman was aboard between North Little Rock and Van Buren. In all respects the trips which I observed of these two trains, 101 and 102, with and without firemen, involved the same operating characteristics and problems. In no respect did the absence of the fireman on the trip between Greenwood Junction and Coffeyville impair the safety of operation. I can also make a

comparison between the local freight service which I observed on June 7 and June 11 between Van Buren and North Little Rock. As shown by Exhibit PX 17 I rode as an observer on a local freight train between Van Buren and Coffeyville on June 9, 1966. The local train on which I rode consisted of two diesel units with a maximum of 37 cars operating a distance of 166 miles between terminals. This train made a total of eight stops for purposes of setting-out and picking-up cars and devoted four hours and twenty minutes to that work. Most of the working day of this local freight train involved an engine crew without a fireman. The things that the fireman did on the runs which I observed between Van Buren and North Little Rock were handled by the other members of the crew on the comparable local freight run which I observed between Greenwood Junction and Coffeyville. In my opinion the absence of the fireman did not create any safety problems and his presence on the other locals between North Little Rock and Van Buren did not contribute to safety of operations.

During the strike on Missouri Pacific in March and April, 1966, I served as an engineer on through freight trains between Kansas City and Little Rock with a crew consisting of myself and three other men. We did the work usually and customarily performed on these assignments, had no difficulty doing it efficiently and safely, and had no crossing accidents or Train-Service employee injuries. During this same strike, I also operated switch engines in the Coffeyville yard with a crew consisting of myself and two other men. We conducted many of these switching operations over public crossings, did the usual and customary work performed on these assignments, had no difficulty in performing it efficiently and safely, and experienced no Train-Service employee injuries or crossing accidents.

In my Division we have been able to remove the fireman from many trains in states other than Arkansas. We have

maintained records in my office of all crossing accidents and Train-Service employee injuries that have occurred in the Division since the Award, and these records reflect in each instance whether or not there was a fireman on the train at the time of the accident. There have been no crossing accidents or Train-Service employee injuries on this Division that involved a train without a fireman that occurred under circumstances that the fireman could have made any contribution to avoiding the incident.

INTERVENORS' REBUTTAL EXHIBIT NO. 2—
Cross-Examination,

By Mr. Ross:

Q. State your name and address, please, sir? A. William A. Wilson, 1208 North 41st, Fort Smith, Arkansas.

Q. What is your educational background? A. I have an equivalency diploma from high school from the Board of Education of the State of Tennessee. I have taken correspondence courses from LaSalle Extension University in practical accounting and have taken correspondence courses from Railway Educational Bureau and International Correspondence School.

Q. Did you successfully complete those correspondence courses? A. I did not quite finish the practical accounting course with LaSalle Extension University. I am in the process now of one of my correspondence courses with Railway Educational Bureau.

Q. Is this Railway Educational Bureau connected with the American Association of Railroads? A. I don't know, sir.

Q. What employment have you had prior to going to work for Missouri Pacific Railroad Company? A. Now the years I'm not going to be sure of. I worked on the W. P. A. immediately after I quit school in North Little Rock. I went to work after the W. P. A. for the ArkMo Lumber Company in North Little Rock and after that I

hired out with the Missouri Pacific Railroad March the 16th, 1942 as a boilermaker helper.

Q. What type of work did you do in the W. P. A.? A. Tool checker and labor.

Q. What type of work did you do with ArkMo Lumber Company? A. I was shipping clerk.

Q. And this is the only employment you have had other than Missouri Pacific? A. I overlooked a few months in New Orleans when I worked in, I'll say a grocery store, a grocery store, yeah.

Q. And you have set out in your statement the jobs you have held with the Missouri Pacific Railroad Company? A. Pardon me. Did you say did I?

Q. I say you have set out in your statement the jobs you have held with the Missouri Pacific Railroad Company? A. Yes, sir.

Q. You have set out all of those jobs that you have held? A. Yes, sir.

Q. Now, I notice that at one time you were an assistant trainmaster at Van Buren and then were transferred to Atchison, Kansas, as assistant trainmaster. At the present time you are working as road foreman of engines with headquarters at Van Buren, Arkansas? A. That is correct, sir.

Q. Was this a demotion? A. It would be considered.

Q. You mentioned in your statement that you served as fireman on hand fired coal burning locomotives and on fuel oil fired locomotives. What percentage of your time was devoted to the lookout function while operating as fireman on a fuel oil fired locomotive? A. I would say approximately it took twenty to twenty-five percent on the lookout.

Q. You spent twenty to twenty-five percent of your time performing the lookout function on a fuel oil powered steam locomotive? A. No. I misunderstood that. I thought you said hand fired, sir. On the hand fired locomotive it might get to, in my opinion, it would have been maybe forty percent as a lookout function.

Mr. Light: I didn't understand whether he was referring to hand fired or fuel oil fired.

The Witness: The last was fuel oil fired you said. The fuel oil fired I would say—the fuel oil fired about forty percent I would say.

By Mr. Ross: Q. What were you doing the rest of your time on the fuel oil fired steam locomotive? A. Watching the gauges, sanding out the firebox and flues, adjusting the steam heat valves on the oil tank.

Q. Where were the gauges located that you had to watch? A. On the boiler of the fireman's side of the boiler head.

Q. They were inside the locomotive? A. Yes.

Q. In the fireman's compartment? A. Yes, sir, in the cab.

Q. So you stayed in the same position to watch those gauges that you positioned yourself to keep a lookout, did you not? A. Normally.

Q. What did watching those gauges involve? A. Watching the steam pressure and the water glass.

Q. Now, could you do this by just glancing at them or did you have to look at them and study them for a while or what took your time? A. We would blow out our water glasses to be sure that the movement in the water glass which indicated the amount of water level in the boiler to be sure that the movement was not restricted.

Q. How did you blow out this water glass, by some—— A. Manipulation of valves at the top and bottom of the water glass.

Q. This was also located in the fireman's compartment of the engine? A. Yes, sir.

Q. In the same position you maintained to keep a lookout? A. Not at all times you couldn't manipulate these valves from a sitting position, no.

Q. How often would you blow out the water in the water glass? A. That was variable. I wouldn't—we didn't have a set time that we blew it out or checked the water

movement in the water glass. We just maintained it to be sure to our own satisfaction that it was indicating the right water level.

Q. Did you blow it out once a trip, twice a trip, once every fifteen minutes? A. Several times a trip.

Q. Several times? A. Yes.

Q. What about sanding out the firebox and flues, what did that involve? A. That involved having to get off of the seat box and use a scoop to put sand into the horn which we put in the door of the firebox.

Q. How many scoops of sand would you put in the firebox each time? A. There was no set number of scoops that we would put into the firebox. It would depend on the amount of soot that was accumulating on the flues of the boiler.

Q. And you could tell this from looking at the smokestack and seeing the color of the smoke? A. Yes, sir.

Q. The density of the smoke? A. Yes, sir.

Q. And what was the other thing you mentioned, the steam—what else did you say you did other than sanding out the firebox and watching the gauges and water glass? A. The valves on the oil tank which were located on the oil tank on the steam manifold of the oil tank which we maintained the temperature of the oil that we used into the firebox. We had a steam valve that we would manipulate to maintain the proper temperature of the oil.

Q. Where is that steam valve located? A. Approximately the center of the oil tank or the cab of the locomotive on the oil tank.

Q. This could be done while you were inside the cab of the locomotive? A. Inside the cab, yes, sir.

Q. In performing these functions other than lookout, took sixty percent of your time? A. Performing these functions, I would say, yes, sir, approximately.

Q. Did you ever operate on a stoker fired steam locomotive? A. Yes, sir.

Q. How much of your time while operating as a fireman

on a stoker fired steam locomotive would you spend performing the lookout function? A. Performing the lookout?

Q. Yes? A. Approximately I'd say twenty-five to thirty percent approximately.

Q. And what was the other seventy-five to eighty percent of your time taken up with? A. Maintaining a watch on the condition of my fire, fire level and the breading at the corners, what we refer to as when we would have to use a scoop to maintain the proper amount of coal in the corners and back in around the fire pot and such as that.

Q. The gauges—pardon me, go ahead, sir? A. The gauges that we referred to, the water gauge and the steam pressure gauge were similar. We also had the gauges for the stoker, the jets and the——

Q. All of these guages were located in the fireman's compartment, weren't they? A. That's right.

Q. You would watch them or reach them from your position of lookout in the fireman's compartment on the left hand side of the engine, could you not? A. Normally except the water glass which you would do as I stated, would have to get out of position to manipulate the valves.

Q. And watching these gauges and the water glass, manipulating these valves and watching the firebox took seventy-five, seventy to seventy-five percent of your time or seventy-five to eighty percent of your time? Is that what you said? A. And watching the coal on these stoker fired engines that we are talking about right now to be sure that it was getting into the conveyors.

Q. Where did you watch that from? A. At times we would have to get up and shovel out, knock our coal down into the conveyor.

Q. You didn't have to do that very often, did you? A. We had to do that quite often, sir.

Q. So on none of these steam engines were you available more than forty percent of the time to perform the lookout function? Is that your testimony? A. That is my opinion, sir.

Q. Would you as fireman arrange your time in performing duties other than the lookout function so that you would be available at times when the train was approaching curves or crossings or any known situation of danger? A. We tried to. I'll say that.

Q. Mr. Wilson, you referred to a study or survey that you participated in for the Missouri Pacific Railroad. What instructiosns did you receive concerning this survey or study? A. We were told that we were to ride some trains and in particular make note as to the work that the crews performed. We were to let the crews function as normal and the only changes that we would make in their work was if we saw an unsafe act that we could anticipate that they were fixing to make to see that the rules were complied with and the work done safely.

Q. Who gave you these instructions? A. The superintendent.

Q. Was the purpose of this survey to obtain information for you to testify on behalf of the carriers in this particular lawsuit? A. That wasn't told to me.

Q. You didn't know why you were making this survey? A. Just in connection with the Full Crew Law.

Q. Who picked the runs on which you were to ride for the purpose of making this study or survey? A. The runs, we didn't—I am trying to say we didn't pick our runs. Mr. Neeley, the assistant trainmaster and I were supposed to work together and we talked about where the runs that we could be on at the same time and still do our other duties. The particular trains, we weren't told which trains to ride, sir. We just done it, I'll say where we could work this study in with the other routine business or duties I should say.

Q. You picked those runs on which you could ride and still enable you and Mr. Neeley to perform your other duties in connection with your occupation? A. Yes, sir.

Q. And the dates, the dates these runs were to be made

were picked in similar fashion? A. You mean the dates that the trains were ridden?

Q. Yes, sir? A. We just got together and the date I'll say didn't enter into the picture in that respect.

Q. You just picked the dates on which you wanted to ride? A. Well, I mean we arranged to be at a certain terminal whether it was the 1st, 3rd is what I had reference to there. We didn't say what month it was or what day of the week.

Q. And I believe you rode four different trains during a period of twelve days from May the 31st to June the 11th, 1966? A. How many did you say, sir?

Q. I believe Exhibit 15 says you made four. Is that correct? A. On Exhibit 15, yes, sir, and then Exhibit 17. There were three other trips, sir.

Q. These other three trips were made outside Arkansas? A. Oh.

Q. Were they not? A. That's right, sir.

Q. Some of them may have begun or ended in Arkansas but they traveled within the limits of other states than Arkansas? A. Yes, sir. I thought you said it took me that long to make those four trips.

Q. No, I just asked you if these trips were made during this twelve day period? A. I misunderstood you, sir.

Q. Other than these seven trips that you made between May the 31st and June the 11th, 1966, did you ride on any other trains? A. Yes, sir, I'm sure I did.

Q. But you made no report on those in your statement here? A. I don't think so.

Q. Mr. Wilson, on page 8 at approximately the middle of the page you state that on one of these runs "I adjusted a safety valve and the fireman observed the air pressure gauge for me during this adjustment" and you go on to say "if I had not been present, this adjustment would not have been made as the condition I corrected does not affect the operation of train." What is the pur-

pose of a safety valve, Mr. Wilson? A. To relieve pressure above the setting of the safety valve.

Q. And the proper adjustment of this safety valve has nothing to do with the safety of the operation of the train? A. No, sir.

Q. What is the function of this particular safety valve? A. To relieve the pressure in the main reservoir when it is in excess of one hundred and fifty-five pounds.

Q. Is there any danger to the operation of the train when this pressure exceeds one hundred and fifty-five pounds? A. The safety valve is adjusted to relieve the pressure whenever it reaches a hundred and fifty-five pounds. This particular safety valve was relieving the pressure of approximately one hundred and ten pounds and I made the adjustment to keep it from relieving the pressure while our compressor was loaded which is unloaded at one hundred and forty pounds.

Q. This air pressure is used in the operation of the air brakes? A. Yes, sir, and other air actuated devices on the engine.

Q. Is this the train air brakes or the engine air brakes? A. Both and other air actuated devices on the engine.

Q. And the fact that this reservoir did not contain more than one hundred and ten pounds of pressure didn't have any effect upon the operation of those brakes? A. No, sir.

Q. How low would the pressure have to get before it would have any effect on the operation of the train brakes, the automatic air brakes on the train? A. Would you state that question again, please sir?

Q. How low would the air pressure in this reservoir have to get before it would have an effect on the operation of the automatic air brakes on the train? A. The standard pressure that we carry on our train for brake operations in the brake pipe pressure is eighty pounds on our freight trains. If the pressure in the main reser-

voir would get below eighty pounds, our brakes would apply on the train.

Q. Why do you normally keep greater air pressure in the reservoir than one hundred and ten pounds? A. Normally?

Q. Yes, sir? A. For use in the other air actuated devices, the excess pressure we call it.

Q. Then, any pressure in the reservoir over eighty pounds, doesn't have any effect on the operation of the air brakes? A. That's right.

Q. On the next page, page 9, next to the last sentence in that first paragraph where you refer to taking an engine off the line and the fireman on this occasion apparently accomplished this by turning a switch. Is this all he had to do to take this engine off the line and prepare it to be taken off the line? A. That was all.

Q. Turn one switch? A. Yes, sir.

Q. Would you tell me the procedure for taking an engine off the line? Do you shut the engine off when you take it off the line? A. No, sir.

Q. Your motor still runs? A. Our diesel engine still runs, yes, sir.

Q. On the locomotive that you take off the line? A. On that unit, yes, sir.

Q. In the next little short paragraph, one sentence long, you referred or you state "The engineer or any other member of the engine crew could have performed this work". Who is considered a member of the engine crew, Mr. Wilson? A. Who is considered the engine crew?

Q. Yes, sir? A. The engineer and the fireman.

Q. All right, if the fireman had been absent then the engineer would have had to perform this work or it wouldn't have been performed? Is that right? A. He could have told another member of the crew.

Q. But not another member of the engine crew? A. Because there are only two members of the engine crew.

Q. Mr. Wilson, this fireman who gets on these trains

at Greenwood to ride them into Van Buren, how many trains will that fireman usually ride in one day? A. I am going to say tour of duty, not more than two.

Q. What do you mean by "tour of duty"? A. They make a trip from Van Buren to Greenwood Junction and back into Van Buren. Then, he is not used anymore until he is called off of the extra board. Now, whenever you said "In a day", that is sometimes a fireman is used twice on the extra board in a day.

Q. So at those times he would make four trips? Is that right, in a day? When he is used from the extra board twice in one day, he would make four trips? A. Yes, some of these trips we deadhead from Van Buren to Greenwood Junction in a taxi cab in order to bring a train which requires a fireman due to the Full Crew Law into Van Buren from Greenwood Junction. Then, that man ties up and is placed back on the extra board so he would actually have made just one trip in that tour of duty.

Q. He is subject to one or more tours of duty in any one day? A. After having rest, yes, sir, at home terminal.

Q. On page 10 you refer to riding train No. 102 between North Little Rock and Van Buren. Did you also ride that train on to Coffeyville, Kansas, on that particular day? A. June the 1st that you refer to departed North Little Rock June the 1st. The same train departed Van Buren to continue to Coffeyville at 5:45 a. m., the 2nd.

Q. Well, my question was did you also ride on that train on that run? A. Oh, I thought you said on that day, sir.

Q. If I did I didn't mean to. Did you also ride on the continuation of 101 from Van Buren to Coffeyville? A. 102.

Q. On page 11 towards the top of the page you refer to "local freight service which I observed on June 7 and June 11 between Van Buren and North Little Rock".

How many locomotives made up the engine consist on each of those trips? A. Two units made the engine consist.

Q. On each occasion? A. Yes, sir.

Q. How many cars were you pulling? A. On each occasion?

Q. Yes, sir? A. The number of cars varied on this trip between North Little Rock and Van Buren. The minimum or maximum number of cars that we had in our train, I don't remember.

Q. Did you make any notes on these runs? A. Yes, sir.

Q. Do you have them with you? A. Not with me here.

Q. Would you have that information on those notes? A. I am sure I have. I am positive.

Q. Have you looked over those notes to refresh your memory prior to coming in for this deposition? A. Those notes, no, sir.

Q. Did you bring them with you today? A. Yes, sir.

Q. But you haven't looked at them? A. No, sir.

Q. So you don't know the maximum number of cars that you handled on either one of these trips? A. No, sir, I don't.

Q. I believe you did recite the maximum number of cars you had on the trip from Van Buren to Coffeyville on June the 9th, the trip you compared with the June 7 and June 11 trips from Van Buren to North Little Rock? A. Yes, sir. Exhibit 17, column 14, the maximum number of cars between Van Buren and Coffeyville and between Coffeyville and Van Buren.

Q. You refer to some operations during the strike on the Missouri Pacific Railroad in March and April of 1966 where you served as an engineer on some through freight runs between Kansas City and Little Rock? A. Yes, sir.

Q. Did the crews operating these trains do the same work that a regular crew would have done on these runs at other times? A. They were normal trips I'll say, Mr. Ross.

Q. Normal railroad operations, nothing different because of the strike? A. You say—phrase that question for me again, please sir.

Q. The operation of this train at the time that you rode on it or these trains at the time you rode on them as engineer was the same as the operation of those trains at times when there was no strike? A. As far as meeting trains and doing station switching which we did, no, sir.

Q. On page 12, the last paragraph of your statement, referring to crossing accidents or train service employee injuries on this division in States other than Arkansas—you state that there were no crossing accidents or train service employee injuries on this division that involved a train without a fireman, that occurred under circumstance that the fireman could have made any contribution to avoiding the accident. Were there any crossing accidents or train service employee injuries on this division during this period of time that you refer to? A. I didn't follow that question. Will you phrase it again, Mr. Ross?

Q. You stated that there were no, either crossing accidents or train service employee injuries which occurred that could have been avoided by the presence of a fireman? A. Yeah.

Q. Were there any crossing accidents or train service employee injuries on this division during this period? A. I'm going to say yes, there have been, yes, sir. I will add to that that there have been but none that a fireman could have prevented.

Q. How many such accidents or injuries have there been? A. Sir, I couldn't say.

* * * *

Redirect Examination,

By Mr. Lucente:

Q. Mr. Wilson, you referred to operating and injector to put water in the boiler during the time that you worked

as a fireman. Was that a relatively important responsibility of a fireman? A. Definitely.

Q. What would happen if the water level was too high in a boiler in steam engine service? A. If the water was too high, the phraseology I guess you would call it, we would pull the water over into the cylinders. If it got too low, we would have a boiler explosion due to the crown sheet becoming too hot.

Q. The first one that you mentioned resulting from too much water, would that cause a malfunction of the steam locomotive? A. To a certain extent in that we could, would lose our lubrication and if the amount of water was great enough, it would damage the cylinders.

Q. I believe Mr. Ross asked you whether you made other trips on trains during the period of time covered by your reports as summarized in Exhibit 15, 16 and 17? A. Yes.

Q. And you answered that you did? A. Yes.

Q. Do you as road foreman of engine ride trains regularly over this territory, Mr. Wilson? A. Yes, sir.

Q. In other words, have you ridden trains not only during the period covered by the report but since the period of the report? A. Yes, sir.

Q. And you rode trains before then, didn't you? A. Yes, sir. That is one of the primary duties, one of the primary duties of a road foreman.

Q. With respect to the situation on runs between Van Buren and Coffeyville where the fireman is part of the crew from Van Buren to Greenwood Junction, you described a situation where the fireman is sometimes deadheaded to Greenwood Junction to take a train to Van Buren? A. Yes, sir.

Q. Do you know what his compensation is for that service deadheading out to Greenwood Junction and taking the train into Van Buren? A. The compensation that he receives for that round trip?

Q. Yes, sir? A. It varies due to the amount of units in the locomotive consist.

Q. Is it what is customarily referred to as a basic day's pay, Mr. Wilson? A. He receives deadhead pay from Van Buren to Greenwood Junction. Then, he has another time slip, the one hundred miles from basic day according to the number of units from Greenwood Junction to Van Buren.

Q. When he comes into Van Buren, does he then go to what is referred to as the "foot of the board"? A. The foot of the extra board, sir.

Q. Will he usually be called again that same day or does more time then expire before he is called again? A. That depends on the number of trains that we are running or the extra set of hostlers that we might have to call in Van Buren.

Q. Is there some limitation on the time which must elapse before you can call that fireman out again? A. Except in emergencies we give them or they are off duty eight hours, sir.

Q. Is that a minimum of eight hours? A. Normally.

Q. When the fireman works a trip from Van Buren to Greenwood Junction as a member of the crew, is his compensation equivalent to one hundred miles in freight service? A. From Van Buren to Greenwood Junction?

Q. Yes? A. Yes, sir.

Q. Then, if he catches a return trip that day, does he receive another one hundred miles at the freight service rate? A. No, sir. If he goes to Greenwood Junction and comes back on another train within eight hours, it is a basic day. Over eight hours that he is on duty, of course, he receives punitive time which is time and a half.

Q. Have you reviewed the statement filed by Mr. Pearsall on behalf of the intervenors in this case, Mr. Wilson? A. Yes, sir.

Q. That is Mr. W. E. Pearsall? A. Yes, sir.

Q. Has Mr. W. E. Pearsall worked in the territory under your jurisdiction? A. Yes, sir.

Q. With respect to Mr. Pearsall's statement referring first to page 6 of his statement, are you familiar with the switching operation which he describes at the Baldwin Piano Company? A. Yes, sir.

Q. Mr. Pearsall described at the top of page 6 a switching movement as follows: "I protect the movement over the crossing. The head brakeman operates the switch. The swing brakeman cuts the cars off and the rear man rides the cars and sets hand brakes". Based on your familiarity with that operation, Mr. Wilson, can the switching movement described by Mr. Pearsall which involves joint activity by four employees be performed by a single employee?

Mr. Ross: I object to that as being a leading question.

Mr. Lucente: I will rephrase the question.

Q. Do you have an opinion as to the number of men required to perform the operation which Mr. Pearsall described? A. Yes, sir.

Q. How many men in your opinion are required to perform that operation safely? A. The movement and the moves that Mr. Pearsall brings out here, one man could do what three men are actually doing here and that's protecting the movement over the crossing, operating the switch and cutting the car off.

Q. At page 12 Mr. Pearsall refers to a switching move at Ozark and he states and I quote: "I protect the movement over the crossing. The head brakeman operates the switch. The swing man pulls the pins and the rear man rides the cars setting the hand brakes". Are you familiar with that operation at Ozark, Mr. Wilson? A. Yes, sir.

Q. Do you have an opinion as to the number of men, the minimum number of men required to perform that operation safely? A. Two men can do it easily.

Q. Mr. Pearsall also refers to, three places in his state-

ment where cars are dropped. I refer to page 7 where he refers to dropping cars at Arkansas Valley. Are you familiar with the location and the industry to which he refers? A. Yes, sir.

Q. Do you know whether or not it is possible at that point for the engine to run around the cars? A. It is not only possible but they are instructed to run around these cars and not what he calls drop them.

Q. Is it necessary to drop cars at that point? A. No, sir.

Q. Again at page 9, Mr. Pearsall refers to dropping cars at the Arkansas Wire Bound Box Company. Are you familiar with the location and the switching movement that he describes there? A. Yes, sir.

Q. Is it necessary to drop cars at that point in order to switch them to the Arkansas Wire Bound Box Company? A. The Arkansas Wire Bound Box Company that he refers to is located at Atkins and there is a double ended track that we tell them to run around the cars instead of dropping them where they have cars for this particular industry on a north bound trip.

Q. At page 11 of his statement Mr. Pearsall refers to dropping cars into the north end of the mine track at the Arkansas Strip Mine. Are you familiar with the location referred to in the switching maneuver described at that point in Mr. Pearsall's testimony? A. Yes, sir.

Q. Do you know whether or not cars are dropped into the north end of the mine track at that point? A. At the Arkansas Strip Mine, it is a double ended track and in his statement, they would not drop the cars into the Arkansas strip. They could shove them in from the north end as they are on a northward trip and he couldn't drop the car into the north end of Arkansas Strip.

Q. Is there a difference between the switching movement which takes place when an engine runs around a cut of cars instead of dropping them, Mr. Wilson? A. Yes, sir, to run around a car, we spot the car between

the switches, cut the engine off and go through another track to get on the opposite end of the car. Then, we can shove it to spot. Whereas, whenever you drop a car which we are not supposed to do, then they get the car to moving, cut the engine off, get away from the car, operate the switch and divert the car on to another track.

* * * *

Recross-Examination,

By Mr. Ross:

Q. How far would the engine have to go at Arkansas Valley to run around the cars as you said and get in a position to shove the cars rather than drop the cars? A. Approximately twenty-five to thirty car lengths.

Q. What track would they run around the cars on? A. We would cut the cars off on the main track, bring the engine through what we commonly call the extension track to get on the other end of the cars.

Q. Would there be any time that there would be any cars located on this extension track? A. We have instructions out that cars will not be left on the extension.

Q. How long have those instructions been out? A. I have been on this territory all except about two years on the Omaha Division since 1956. We sometimes use the extension track moving trains.

Q. At Arkansas Wire Bound Box Company, how far would the engine have to go in order to run around the cars to get in a position to shove the cars rather than drop the cars? A. Approximately twenty to twenty-five car lengths.

Q. That is twenty to twenty-five car lengths round trip or one way? A. Around the run around track.

Q. About a quarter of a mile? A. Pardon?

Q. About a quarter of a mile? A. Less than that, sir.

Q. Twenty-five cars will be approximately a quarter of a mile long? A. No, sir.

Q. How many cars would it take to make it a quarter of a mile? A. Approximately thirty-five, thirty to thirty-five I'll say.

Q. What length cars are you referring to, Mr. Wilson? A. We figure normally about fifty foot cars.

Q. Do cars vary in lengths from forty feet to eighty-nine feet in length? A. Did you say eighty-nine?

Q. Eighty-nine, yes, sir? A. Yes, sir.

Q. Back for just a minute to the fireman operating between Greenwood and Van Buren, that fireman can be worked as long as sixteen hours in any twenty-four hour period, can he not? A. True.

Mr. Ross: That is all.

The Witness: Mr. Ross, I would like to qualify that yes on that sixteen hours. After they work back into Van Buren, they have to tie up if they have just been on duty one hour but the hours of service law says that sixteen hours within a twenty-four hour period. I wanted, what I mean I didn't want to say that he could come in and go back, come in and go back. When he gets back to Van Buren, he has to tie up but the maximum number of hours in a twenty-four hour period, the answer is yes, due to the hours of service law.

By Mr. Ross: Q. You say he has to "tie up". What do you mean by that? A. That is the fireman, whenever they are called by Van Buren, they can make only a round trip to Greenwood Junction and back to Van Buren; whereas, the brakeman, the Full Crew Law, a special agreement where they are used more than one round trip before they are tied up sometimes.

Q. If the fireman's name comes up on the extra board before eight hours has expired since he has tied up, can he not be sent back on a run from Van Buren to Greenwood? A. Only in an emergency when there is no other rested fireman available.

* * * *

Re-Redirect Examination,

By Mr. Lucente:

Q. Are you familiar with the manner in which the extra board is regulated, Mr. Wilson? A. Yes, sir.

Q. When a fireman makes a trip from Van Buren to Greenwood Junction and returns, does the agreement between the Brotherhood of Locomotive Firemen and Enginemen of the Missouri Pacific require that he be dropped to the foot of the board? A. Yes, sir, first in and first out, sir.

Q. In other words, after that kind of service you are required to put them at the bottom of the extra board? Is that right? A. Yes, sir.

Q. And if the extra board is regulated so that you have enough employees on the board, he normally will not come up to the top of the board again until approximately something between eight and sixteen hours having elapsed, will he not?

Mr. Ross: Object to that as a leading question.

By Mr. Lucente: Q. Is the size of the extra board regulated by the carrier alone? A. No, sir. We work with the local chairman to maintain a sufficient number of men on the extra board to regulate the mileage and we, management and the local chairman of the firemen add to and take off of the extra board to maintain a sufficient number of men.

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PLAINTIFFS' EXHIBIT NO. 3—**Testimony of L. W. Day.**

INTERVENORS' REBUTTAL EXHIBIT NO. 3—

Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 4—**Testimony of L. U. Allen.**

INTERVENORS' REBUTTAL EXHIBIT NO. 4—**Cross-Examination.**

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 5—**Testimony of J. H. Rogers.**

INTERVENORS' REBUTTAL EXHIBIT NO. 5—**Cross-Examination.**

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 6—**Testimony of D. M. Neely.**

INTERVENORS' REBUTTAL EXHIBIT NO. 6—**Cross-Examination.**

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 7—**Testimony of Donald L. Halferty.**

My name is Donald L. Halferty. I am employed by the Missouri Pacific Railroad Company as Trainmaster with headquarters at McGehee, Arkansas.

I was first employed by the Missouri Pacific in August of 1947 as a Switchman with headquarters at Poplar Bluff. In May of 1948 I was given an authorized leave of absence and returned to work for the Missouri Pacific in May of 1949 as a Switchman and Extra Yardmaster with

headquarters at Poplar Bluff. In October of 1956 I became a General Yardmaster with headquarters at Monroe, Louisiana, which position I held until October of 1958 when I became Assistant Trainmaster for the Union Railway with headquarters at Memphis, Tennessee. In April of 1961 I was promoted to the position of Trainmaster at the St. Louis Terminal. I served in this position for several months after we put into effect the Award of Arbitration Board No. 282 which enabled us to reduce a substantial number of our switch crews to three men. These switching operations are conducted extensively throughout the metropolitan St. Louis area over public crossings, and our operations with three-man crews did not show any increase in employee injuries or crossing accidents.

In February of 1965 I was transferred as Trainmaster to McGehee, Arkansas, which position I am presently holding. I have been a dues paying member of the Brotherhood of Railroad Trainmen since 1947.

As Trainmaster I am responsible for supervising and instructing the train and engine crews in this Division, and in the performance of those duties I ride 10 to 15 trains per month. Approximately 65% of the time I am on these trains I am positioned in the locomotive and the balance of the time I am in the caboose. Also I make daily observations of both freight and yard crews in the performance of their work.

My participation in the survey of freight service on the Missouri Pacific Railroad, in the capacity of an observer on certain runs, is shown by the lines on Exhibits PX 16 and PX 17 which bear my name as an observer. On June 7, 1966, I rode on the caboose of Train No. 83 between McGehee, Arkansas, and Monroe, Louisiana for the purpose of observing the activities of the train crew. The train in question had a crew of a conductor and three brakemen from McGehee to Jones, Louisiana, and a crew of two brakemen for the remainder of the run. There were

no stops for the purpose of switching en route but there were two stops for other purposes. One of the stops was for the purpose of inspecting the train at Collinston. At the time that the stop was made at Collinston the third brakeman had gone off duty at Jones, Louisiana. Consequently, the inspection of the train at Collinston was made with a crew consisting of a conductor and two brakemen. This inspection was efficiently and adequately performed by the crew on duty at the time that the train stopped at Collinston. It was performed by having the head brakeman drop off the locomotive while the train pulled past him. The head brakeman then inspected the other side of the train by walking back to the engine. The rear brakeman walked to the midway point and then inspected the other side of the train as it pulled past him. The rear brakeman then boarded the caboose and continued on the trip to Monroe. I also rode Train No. 83 on the next leg of its run from Monroe to Alexandria on June 7 as shown in Exhibit PX 16. The train crew on the run from Monroe to Alexandria consisted of a conductor and two brakemen. The characteristics of the operation between Monroe and Alexandria were essentially the same as the operation between McGehee and Monroe. The diesel consist was four units between Monroe and Alexandria, the road time was a little over three hours for a run of 96 miles, the maximum number of cars was 90, there were no stops for setting-out or picking-up cars and there was one stop for other purposes. The train was inspected at Georgetown in the same manner as it had been inspected at Collinston by a train crew consisting of a Conductor and two brakemen. Between McGehee and Monroe the maximum number of cars was 90, the road time between terminals was three hours for a run of 94 miles, there were no stops for picking-up, setting-out or switching, and two stops for other purposes. On the basis of my experience in freight operations and my observations of Train No. 83 in and

outside of Arkansas, I can state that no safety problems arise in through-freight service because of the use of a train crew consisting of a conductor and two brakemen as distinguished from a train crew consisting of a conductor and three brakemen.

My observations also included four trips on local freight trains operating between Monroe and McGehee, between McGehee and Helena, between Holly Grove and Paragould and on a turn-around assignment from McGehee to Warren and return. The data with respect to these trips appears in Exhibit PX 16. On all of these trips the train crew consisted of a Conductor and three Brakemen. These trains performed from two to five hours of switching work at various stops. The switching work which these employees performed does not require a crew of a Conductor and three Brakemen. Similar work is performed by local freight crews consisting of a Conductor and two brakemen on other portions of the Missouri Pacific system with complete safety. It is possible that in some situations the larger crew might perform the switching more expeditiously but certainly as far as safety is concerned the larger crew does not add anything to that aspect of the operations. Between terminals when the train is moving the primary function of the train crew is to observe the train for defects and so forth. The nature of the caboose is such that this observation work can normally be done with two employees. In other words, a train crew which places a Conductor and one brakeman in the caboose provides all of the personnel necessary for the inspection of the train while it is moving between terminals.

During the Missouri Pacific strike in March and April of 1966 I worked as a Conductor on through freight trains between McGehee and Little Rock, Little Rock and Alexandria, and Alexandria and Monroe. These trains had crews of five men consisting of myself, the Superintendent, two Roadmasters, and a Special Agent. During this strike

I also worked as Engineer on a switch engine which had a crew of five men consisting of myself, a Roadmaster, a Claim Agent, a General Agent, and a Special Agent. We conducted switching operations in Bastrop, Louisiana, including switching over public crossings. There were no crossing accidents or personal injuries of any sort arising out of these operations I participated in during this strike.

In 1964 during the strike on the Missouri-Illinois Railroad Company I worked on a traveling switch engine from Crystal City to Riverside, Missouri, as a member of a three-man crew, and also worked on a yard engine in yard switching operations at Ste. Genevieve as a member of a four-man crew. I was engaged in this work for a total of six days and no crossing accidents or personal injuries of any sort arose out of the operations in which I participated.

INTERVENORS' REBUTTAL EXHIBIT NO. 7.—

Cross-Examination.

By Mr. Ross:

Q. State your name, please sir? A. D. L. Halferty, 801 North Third Street, McGehee, Arkansas.

Q. What is your educational background, Mr. Halferty? A. I have a high school education.

Q. And where was that obtained? A. Poplar Bluff, Missouri.

Q. You graduated from high school? A. Yes, sir.

Q. What year was that? A. 1943.

Q. What employment did you have prior to going to work for the Missouri Pacific Railroad Company? A. I worked in a drug store at Poplar Bluff after graduation from high school and prior to entering the Army and, after my discharge from the Army, I returned to the drug store and later hired out on the railroad.

Q. Is this the extent of your prior employment then? A. Yes, sir.

Q. And you went to work for the Missouri Pacific in 1947 as a switchman? A. Yes, sir.

Q. Working in the yards at Poplar Bluff, Missouri? A. Yes, sir.

Q. Have you ever had any operating experience as a trainman in road service? A. Not prior to being promoted. I have experiences in yard operation only.

Q. You have never operated as a trainman? A. No, sir.

Q. In road service? A. No, sir, not prior to being promoted.

Q. And I take it you do not have any experience as an engineman either? Is that true? A. No, sir, no experience.

Q. You have never operated as an engineman? A. I have operated an engine as an engineman during the recent strike on the Missouri Pacific.

Q. When was that? A. Let's see, that was in the latter part of March I believe of 1966.

Q. How many days did you operate as an engineman? A. I believe it was two days.

Q. Did you operate as an engineer? A. Yes, sir.

Q. And this was the first and only time you ever operated as an engineer? A. That's the only time I ever actually operated an engine as an engineer, yes, sir.

Q. And you operated for a total of six days as an engineer? A. No, sir, two days only as an engineer.

Q. And four days as a member of the train crew or switching crew? A. Yes, sir, that's correct.

Q. What was the nature of these operations during the strike? A. During the strike, I worked as a conductor on a train from McGehee to Little Rock. Then, from Little Rock to Alexandria and then from Alexandria back to Monroe.

Q. These trains operated as through freight trains? A. Yes, sir. The trains I was on were through freight trains. We did make one set-out at McGehee on a southward trip.

Q. This was just a straight set-out, no industrial switch-

ing of any kind? A. No, sir, on this particular train it was a straight set-out, yes, sir.

Q. Were most of the runs during the strike limited to through freight trains? A. No, sir. The trains that I worked on as a conductor were through freight.

Q. That is what I was after. On these three freight trains that you operated as conductor during the strike, how many cars were you pulling on the McGehee to Little Rock run, for instance? A. I don't know how many cars were on that train to be frank about it. To the best of my memory I think it was somewhere around one hundred and twenty-five cars.

Q. How many cars were on the Little Rock to Alexandria run? A. Approximately the same number. I don't know the exact total.

Q. And the Alexandria to Monroe? A. About the same number but again I don't remember the exact total.

Q. How many engines, how many locomotive units on the McGehee to Little Rock run that you made? A. I believe it was three units but again I am not sure.

Q. You were working as conductor on those runs? A. Yes, sir.

Q. And not in the engine crew? A. That's right.

Q. Mr. Halferty, you referred to a survey that was made some time during I believe June of 1966. What instructions did you receive concerning this survey? A. My superintendent at that time told me to make this survey which would be in regard to the Arkansas Full Crew Law observing the functions of the different crew members and I rode one through freight from McGehee to Monroe, Louisiana and the same train then from Monroe to Alexandria.

Q. All right, you were instructed then to ride these trains for the purpose of making this survey? A. Yes, sir.

Q. To be presented as testimony in the full crew litigation, this particular case we are in now? A. Yes, sir, I was told I would probably have to give a statement.

Q. And these runs were made, the survey was made for the purpose of giving a statement, wasn't it? A. Yes, sir, that's right.

Q. Who picked the particular runs to be included in this survey? A. Well, I was told to ride a through freight from McGehee to Alexandria and the choice of the run that I rode was my own.

Q. What was the weather like on that through freight, Mr. Halferty? What were the weather conditions on that particular day? A. It was clear and warm.

Q. And this was during the Summertime? A. Yes, sir.

Q. Generally operating the railroad is easier in the Summertime than it is at other times of the year, isn't that true? A. Well, I wouldn't say it was easier. It would probably be more comfortable and less burdensome, not as many clothes and so forth.

Q. This is the only difference, the comfort of the crew? A. Well, the work as far as the actual operations is primarily the same both in Winter and Summer.

Q. Does snow, rain, sleet, ice have any effect on the operation of the railroad? A. Well naturally it would slow the operation down in regards to throwing of switches and the physical part of the work.

Q. How did you pick these particuar runs on which you rode? A. I just picked a through freight, no particular one for any given reason.

Q. How many through freights are there each day over this territory? A. We have three regular through trains in each direction.

Q. And you rode one of them in one direction, that is, from McGehee to Monroe? A. Yes, sir, that's right. But I did continue on the same freight then from Monroe to Alexandria.

Q. But it was the same train, the same run? A. Yes, sir.

Q. And that was three through freights in each direction or a total of six per day over this territory, that operate

over this territory? A. Yes, sir, six through freights per day.

Q. How many engines were there on a locomotive consist on this through freight run? A. Can I check my records? I don't remember for sure.

Q. Sure. A. Four units.

Q. And how many cars? A. Forty-nine loads and forty-one empties.

Q. You mention that two stops were made; one in Collinston, Louisiana for a train inspection. Was the other one at Sunshine for another train inspection? A. Yes.

Q. What was the other stop? A. Yes, sir, it was Sunshine for an inspection.

Q. These were the only two stops you made on that particular run? A. Yes, sir. May I correct that statement?

Q. Certainly. A. The inspection made at Sunshine was a pull-by inspection. We did not make a stop. I believe the one stop was for a ballast drainage plow which was working but we actually didn't make a stop at Sunshine.

Q. The stop was made then for maintenance of way personnel? A. Yes, sir.

Q. Working on the track? A. Yes, sir.

Q. Or around the track? A. Yes, sir.

Q. You operated on or you included four local freight runs in your survey? You indicate that you made four trips, one from Monroe to McGehee, one from McGehee to Helena, one from Holly Grove to Paragould and one from McGehee to Warren and return? A. Yes, sir.

Q. Is the engine on the train from McGehee to Warren and return to McGehee usually turned at Warren for the return trip or is it usually operated in the opposite direction? A. It is not turned. It is operated in the opposite direction on the return trip.

Q. Is the engine usually a dual control engine or a single control engine? A. It is not always a dual control engine. There are times when it is a single control unit.

Q. And would that be the majority of the time? A. I don't know to be frank. I never know as far as the engine whether it is a single control or a dual control when it leaves McGehee.

Q. How long does the run from McGehee to Warren usually take? A. Usually around ten hours.

Q. Sometimes longer and sometimes less? A. Yes, sir.

Q. How many cars did this train pull that you rode on from McGehee to Warren and return? I believe Exhibit 16—now, this McGehee to Warren train we are talking about is number 783-784? Is that the one? A. Yes, sir.

Q. Exhibit 16 indicates that the number of cars was fifty-three. Was this the maximum number of cars that was pulled by this train at any one time? A. Yes, sir, that was the maximum cars.

Q. This figure would not indicate the total number of cars handled on this run though, would it? A. No, sir, but I do have it broken down by stations, the number of cars.

Q. All right, how many cars did you have for Warren? A. For Warren nine loads and nine empties.

Q. How many cars did you pick up at Warren? A. That was the total cars we left Warren with. I don't know how many we did pick up there.

Q. How many did you leave at Warren? Do you know that? A. We set-out and spotted eight cars and pulled and picked up seventeen.

Q. Mr. Halferty, in answering these questions you are referring to some notes you have before you? Is that right? A. Yes, sir.

Q. Are these notes that you made while you were on this particular run? A. Yes, sir, and part of the notes are the conductor's 2704.

Q. May I see those notes, please sir?

(Off the record discussion.)

A. (The witness passed a sheaf of papers to Mr. Ross.)

Q. Mr. Halferty, on these reports—by the way, is this the printed form given you prior to your making this run? A. Yes.

Q. On which to make this survey? A. Yes, sir.

Q. You indicate that stop number one was Dermott, Arkansas? A. Yes, sir.

Q. Do you have some notes as to what the conductor and each one of the brakemen were doing? A. Yes, sir.

Q. Would you read those, please sir? A. "Stop Number One, Dermott, Arkansas. Conductor stayed on the cab while station switching done. Crew set-out five cars and conductor worked on wheel report".

Q. You say "stayed in the cab". Is that the caboose? A. Yes, sir.

Q. Go ahead? A. "Brakeman Number One, the head brakeman, R. L. Jolley assisted in station work setting-out five cars. Brakeman number two, E. L. Wash, assisted in station work, switching, setting five cars out of train and spotting cars. Brakeman number three, E. P. Christmas rode cab to Dermott and proceeded to head-in to assist in setting out five cars and station switching".

Q. All right, stop number two? A. Stop number two, Monticello, Arkansas. "Conductor received instructions from agent and assisted rest of crew in station work setting out twenty-three cars and picking one car up. Brakeman number one, head brakeman, R. L. Jolley, assisted in switching operations setting out twenty-three cars, picking up one and doing station work. Brakeman number two, E. L. Wash, assisted in switching, station work, setting out and picking up. Brakeman number three, E. T. Christmas, assisted rest of crew in station work."

Q. All right, stop number three? A. "Stop number three, Warren, Arkansas. Conductor assisted rest of crew in station work setting out and spotting eight cars and pulling and picking up seventeen cars. Brakeman number one, head brakeman, R. L. Jolley, assisted in station work set-

ting out eight cars, picking up seventeen and making up train for return trip to McGehee, Arkansas. Crew ate at Warren". "Brakeman number two, assisted in work leaving eight cars, picking up seventeen cars and making up train for return to McGehee. Crew also ate here. Brakeman number three, E. T. Christmas, assisted crew in station work and eat".

Q. Stop number four? A. "Stop number four, Monticello, conductor stayed in cab working on wheel report while rest of crew picked up twenty-four cars off A. D. and N. interchange and switched wood track. Brakeman number one, R. L. Jolley assisted in picking up twenty-four cars off A. D. and N. interchange, pulled and spot wood track, picking up seven loads and spotting eleven empties. Brakeman number two, E. L. Wash, assisted head brakeman in picking up off of A. D. and N. interchange and pulling and spotting wood track. Brakeman number three, E. T. Christmas, stayed on cab with conductor and helped with wheel report".

Q. Stop number five? A. "Stop number five, Dermott, Arkansas, conductor stayed on cab while rest of crew picked up two cars and head brakeman get track and time on main track for trip to McGehee. Brakeman number one, head brakeman, R. L. Jolley, assisted in picking up two cars. Brakeman number two, E. L. Wash, assisted in picking up two cars, got track and time for work on main line

four cars off A. D. and N. interchange, pulled and spot wood track, picking up seven loads and spotting eleven empties. Brakeman number two, E. L. Wash, assisted head brakeman in picking up off of A. D. and N. interchange and pulling and spotting wood track. Brakeman number three, E. T. Christmas, stayed on cab with conductor and helped with wheel report".

Q. Stop number five? A. "Stop number five, Dermott, Arkansas, conductor stayed on cab while rest of crew picked up two cars and head brakeman get track and time on main track for trip to McGehee. Brakeman number one, head brakeman, R. L. Jolley, assisted in picking up two cars. Brakeman number two, E. L. Wash, assisted in picking up two cars, got track and time for work on main line
and trip to McGehee. Brakeman number three, E. T. Christmas, assisted in station work and lined switch for main track on departure to McGehee".

Q. Were there any other stops on this run? A. I show two stops Warren to eat for thirty-five minutes and Dermott five minutes for track and time.

Q. May I see this again? A. (Witness passed the sheaf of papers back to Mr. Ross.)

Q. How long did this run between McGehee and Warren take on this particular day? A. The conductor was on duty

ten hours and forty-nine minutes and the brakemen ten hours and thirty-nine minutes.

Q. Were the other runs that you made on local freight trains for this survey similar to this one? A. Yes, sir, they were similar.

Q. Were the crew performing similar work? A. Yes, sir.

* * * *

Redirect Examination,

By Mr. Lucente:

Q. Mr. Halferty, the last stop that this train made was at Dermott on the return trip, was it not? A. Yes, sir.

Q. How many cars were picked up at Dermott? A. Two cars at Dermott.

Q. What was the conductor doing at the time these cars were picked up at Dermott? A. He was on the caboose.

Q. What was the head brakeman doing at the time these two cars were picked up? A. The head brakeman and one other brakeman went to the phone booth to get track and time and then they picked the two cars up.

Q. Have you observed that operation being done on other occasions by one man? A. No, sir, I haven't.

Q. Have you observed the getting of time being performed by one man? A. Yes, sir.

Q. Did the third brakeman assist in setting and picking up these two cars at Dermott? A. What was that question?

at Dermott on the return trip, was it not? A. Yes, sir.

Q. How many cars were picked up at Dermott? A. Two cars at Dermott.

Q. What was the conductor doing at the time these cars were picked up at Dermott? A. He was on the caboose.

Q. What was the head brakeman doing at the time these two cars were picked up? A. The head brakeman and one other brakeman went to the phone booth to get track and time and then they picked the two cars up.

Q. Have you observed that operation being done on other occasions by one man? A. No, sir, I haven't.

Q. Have you observed the getting of time being performed by one man? A. Yes, sir.

Q. Did the third brakeman assist in setting and picking up these two cars at Dermott? A. What was that question?

Q. Did the third brakeman assist in picking up these two cars at Dermott on the return trip? A. Yes, sir, he did.

Q. With respect to the getting of track and time at Dermott, can that be done by use of the radio? A. Yes, sir, it may.

* * * *

Recross-Examination,

By Mr. Ross:

Q. Mr. Halferty, how does the track from McGehee to Warren, is this portion of the railroad a dark railroad?

A. The portion from McGehee to Dermott is centralized traffic control and from Dermott to Warren is dark railroad.

Q. And by "dark railroad", you mean it is not controlled by either centralized traffic control or automatic block signals? A. Yes, sir.

Q. It's run by timetable and train orders? A. Yes, sir.

Q. Is there any limit to the number of train orders that can be issued on any one run? A. No, sir.

* * * *

Re-Redirect Examination,

By Mr. Lucente:

Q. With respect to the dark railroad territory to which you referred, is flagging required when you come to a stop on that segment of the railroad? A. No, sir.

* * * *

Q. Is there an outstanding order with respect to flagging protection on that territory, Mr. Halferty? A. Yes, sir, I believe it is covered by special instructions in the timetables.

Q. What do these special instructions provide? A. I would have to look at my timetable to——

Q. Is it your recollection that there is a special instruction with respect to flagging instructions in this territory? Is that right? A. Yes, sir.

* * * *

Re-Recross-Examination,

By Mr. Ross:

Q. Does the special instruction apply only to Dermott to Warren and return to Dermott? A. Yes, sir.

* * * *

Re-Redirect Examination,

By Mr. Lucente:

Q. Between Dermott and McGehee, what is the nature of the signal protection, Mr. Halferty? A. It is——

Q. Is it C. T. C. territory? A. C. T. C. territory, yes, sir, and automatic block section.

Q. Do you furnish flag protection when a train comes to a stop in that territory? A. No, sir.

Q. Is that covered by operating rule 99? A. Yes, sir, and special instructions in the timetable.

* * * *

Re-Recross-Examination,

By Mr. Ross:

Q. Would it ever be necessary to afford flagging protection on this track from McGehee to Dermott? A. If for some reason—can I read my timetable just a minute?

Q. Certainly. A. If for some reason more than, other than the local were run on this subdivision, flag protection would be required.

* * * *

PLAINTIFFS' EXHIBIT NO. 8—
Testimony of Loy D. Alcorn.

My name is Loy D. Alcorn. I am employed by the Missouri Pacific Railroad Company as Trainmaster with headquarters at Newport, Arkansas. The territory over which I have jurisdiction includes the Hoxie subdivision between Poplar Bluff, Missouri, and Little Rock, the Memphis subdivision between Bald Knob and Memphis, the Marianna subdivision between Memphis and Hughes, the Doniphan subdivision between Neeleville, Missouri and Doniphan, Missouri, and the Doniphan, Kensett and Searcy Railroad Company.

I entered railroad service with the Southern Pacific Railroad Company at San Antonio in October, 1945, as a Switchman and about six weeks thereafter was transferred to Houston, Texas, as a Brakeman. I worked as a brakeman out of Houston until 1951, and then was employed by Missouri Pacific Railroad Company as a Switchman at San Antonio. In February of 1953 I became a Switchman and Brakeman with headquarters at San Antonio, and in January of 1955 was promoted to Conductor on the Kingsville Division with headquarters at Kingsville. In October, 1955, I transferred to the DeQuincy Division where I worked as a Brakeman until December of 1955 when I transferred to the Kingsville Division where I worked as a Conductor until August, 1958. I was promoted to Assistant Trainmaster of the DeQuincy Division with headquarters at Lake Charles, Louisiana, in August of 1958. In November of 1959 my headquarters were changed to DeQuincy and I was promoted to Trainmaster and served there until August of 1962 when I was transferred to the Arkansas Division with headquarters at Newport, Arkansas, also as Trainmaster.

During the time I worked as a Brakeman out of Houston I worked on local freights, through freights, and also worked as a Flagman on passenger trains. The crews to which I was assigned on through freights were composed of a Conductor and two Brakemen, our average train was about 150 cars, and I had no experience in this work where any additional crew members were needed to perform the work. During this time I never observed a mishap or accident, or near accident, that could have been avoided by having additional crew members. Based on my experience as a Brakeman for about 10 years I know that there are no duties or tasks on a through freight train that cannot be safely and efficiently performed by a crew of a Conductor and two Brakemen.

On the local freight trains on which I worked the third

Brakeman's duty was to serve as a Flagman to the rear of the train. To do this he was required to place himself approximately a mile to the rear of the train any time it was stopped under circumstances where it might be overtaken by a following train, thus he was not available to help with the switching operations. Under present Rules and Special Instructions, there is no requirement that flag protection be provided in automatic block signal territory where there are two block signals to the rear of the train. The signal equipment is so placed in my territory that there are always two block signals to the rear of any train except on the Doniphan and Marianna subdivisions. On those subdivisions, which are not equipped with automatic block signals, the Special Instructions provide that it is unnecessary to provide flag protection to the rear because these are "light traffic subdivisions" and normally there would be only one train on them at a time. In the very unusual event that two trains were to be on these subdivisions at the same time, a train order would be issued by the Dispatcher to insure adequate protection.

In my service as a Conductor for over three years on the Kingsville Division we had only two Brakemen on both local and through freight trains and this created no obstacle to our carrying out the work of handling these trains safely and efficiently.

During the survey of train operations on the Missouri Pacific Railroad, the results of which are summarized in Exhibits PX 15, PX 16, and PX 17, I made a total of eight observation trips. These trips were all in through freight service and my assignment was to observe the activities of the train crew by riding on the caboose. Two of these observation trips were made on June 14 involving a through freight movement from Poplar Bluff to North Little Rock to Texarkana. The movement from Poplar Bluff to North Little Rock did not involve any stops and was made in three hours and twelve minutes.

The second movement from North Little Rock to Texarkana involved one stop for the purpose of inspecting for a reported hot-box. None was found. On both of these trips there was a rolling inspection of the train. Otherwise the train crew merely rode and observed the train. I concur in Mr. Halferty's statement that both the train inspection and the observation of the train while it is moving does not require a crew consisting of a Conductor and three Brakemen. The maximum personnel necessary for such inspection, as shown by the manner in which inspections of that kind are made in territory outside of Arkansas, is a crew of one Conductor and two Brakemen.

I made two observation trips on June 15, 1966, on a through freight run from Texarkana to Poplar Bluff. These movements were, in all essential respects, the same as the movements which I observed on June 14. On June 19 I made two observation trips moving from Poplar Bluff to North Little Rock to Texarkana, and on June 21 I rode a through freight train from North Little Rock to Poplar Bluff. These train movements were, in all respects, similar to the movements which I observed on June 14 and my comments regarding the size of the crew necessary for safe operations are applicable to these other movements. The final trip on which I rode as an observer took place on July 20, 1966, when I rode Train No. 62 from Texarkana to North Little Rock. On this movement one stop was made to set out a hot-box which was discovered by the head Brakeman. This set-out required 30 minutes of time. With a crew of a Conductor and two Brakemen, of course, a head Brakeman would still be in the position that the head Brakeman on this train was in. Consequently the discovery of the hot-box would have occurred in the same manner.

The through freight operations which I observed were parts of train movements which continued into states other than Arkansas. Train No. 61, which I rode on

June 14 from Poplar Bluff to Texarkana, had a prior movement from St. Louis to Poplar Bluff on which Mr. Austin observed the activities of the train crew. Train No. 66 which I rode on June 15 from Texarkana to Poplar Bluff had a following movement from Poplar Bluff to Dupo which Mr. Austin observed. Train No. 65 which I rode from Poplar Bluff to Texarkana on June 19 was observed by Mr. Austin on its preceding run from Poplar Bluff to Dupo. "A" train which I rode on June 21 from North Little Rock to Poplar Bluff was ridden on that same day by Mr. Austin from Poplar Bluff to Dupo. The movements observed by Mr. Austin all involved crews consisting of a Conductor and two Brakemen. As the data, with respect to Mr. Austin's observation show, the movements with the smaller crews outside of Arkansas were as safe as the movements with the larger crews within the State of Arkansas. Comparison of the data also shows that operating features of the trips were comparable in all significant respects.

INTERVENORS' REBUTTAL EXHIBIT NO. 8—

Cross-Examination,

By Mr. Ross:

Q. State your name and address, please? A. Loy Donald Alcorn, 405 Pecan, Newport, Arkansas.

Q. Mr. Alcorn, is that how you pronounce that? A. Yes.

Q. What is your educational background, please sir? A. My educational background is a high school education and I taken an International Correspondence Course in railroad administration.

Q. Did you graduate from high school, sir? A. Yes, sir, I graduated from high school.

Q. Where? A. In Poth, Texas.

Q. And when was that that you graduated? A. That was in 1939.

Q. What employment did you have prior to going to work for the Missouri Pacific Railroad? A. I had no employment prior to the Missouri Pacific, only one and that was the Southern Pacific Railroad.

Q. And you indicated that employment in your statement I believe? A. Yes.

Q. You went to work for the Southern Pacific in 1945? A. Yes, sir, that is correct.

Q. Were you in the Military Service prior to that time or what had you been doing from 1939 until 1945? A. I was in the United States Marine Corps four years and eight months prior to that.

Q. You have had no other employment then? A. No, sir.

Q. Prior to August of 1962, had you had any employment with the railroad, either Missouri Pacific or any other in the State of Arkansas? A. I left the Southern Pacific in 1951 and became an employee of the Missouri Pacific as a switchman at San Antonio, Texas in 1951.

Q. My question was prior to 1962 had you worked in Arkansas for any railroad? A. I was coming to it from Texas.

Q. Go ahead, sir? A. I continued employment with the Missouri Pacific until August the 1st, 1962 when I was headquartered at Newport, Arkansas as a trainman.

Q. And you have been in Arkansas since 1962? A. Yes, sir.

Q. Have you had any operating experience as either a trainman or an engineman in Arkansas? A. No, sir, not in Arkansas.

Q. In your statement which is Exhibit 8 of the Carrier's testimony, you refer to a survey which you participated in in June and I believe one date in July of 1966. What instructions did you receive pertaining to this survey? A. I was given instruction by my superintendent to ride certain trains and keep a log as to the crew members who I observed, their activities, their duties.

Q. And that was for the purpose of testifying on behalf of the carrier in this lawsuit? A. That is correct, yes, sir.

Q. Were you given forms to fill out? A. Yes, sir, we were given forms from which we could follow an outline as to what, to make it easier for us in following this sort of a diary log.

Q. This was an outline of the questions that the carriers wished you to answer while you were making this run? A. Well, not so much questions to answer. We were only to observe the employees and their actions and activities during their tour of duty and with the times and so forth as to make the statements correct.

Q. These forms called for specific information to be filled in on these forms? Is that true? A. Such as required information.

Q. How were the runs chosen? A. The runs that I made were chosen at random as we did not pick any particular runs that we just picked runs that we could make such as be able to double back and not make a long lay over at any one terminal.

Q. Who picked these runs? A. Well, I assisted the superintendent in picking the runs.

Q. What criteria did you and the superintendent use in picking these runs? A. Well, do you mean we tried to pick the easiest runs or hard runs?

Q. I want to know what basis or criteria that you used to pick the runs? On what basis were these particular runs picked? A. Well, as it was in the afternoon on this day and we were to begin the runs that evening, I was to ride train No. 8 from Little Rock to Poplar Bluff and I was to pick a train that I could get out of Poplar Bluff after the arrival of train No. 8 to make a close connection whereas I would not be a long period of time at Poplar Bluff and that began the runs and, as the trips began, we would turn around at the next terminals on the next train that was available.

Q. You picked runs that it was convenient for you to ride? Is that right? A. Not so much convenient. It was to pick the next train that was going out whether it would have been convenience or to just make the trip.

Q. Who selected the dates on which these runs were made, on which you rode on these runs? A. Well, I more or less selected the dates myself as there were some runs I thought I could get on arrival at the next terminal which I was unable to get so they just fell at random, most of them did with the exception of the first trip.

Q. Mr. Alcorn, you listed or there is listed on Exhibit 16 eight runs which you rode. Some of the runs are from Poplar Bluff to North Little Rock and then North Little Rock to Texarkana is a separate run. Were these just continuations, the trip from North Little Rock to Texarkana was that just a continuation of the same train that came from Poplar Bluff to North Little Rock? A. That is correct such as you see train 61 out of Poplar Bluff at eleven a. m. to North Little Rock. Crews were changed and the train's consist also was changed and we departed North Little Rock at 5:05 a. m. and run to Texarkana.

Q. I believe you rode a total of five different numbered trains. Is that right? A. Yes, sir.

Q. And all of these trains were in through freight service? A. Yes, sir, they were all through freight trains.

Q. How many local trains are there that operate over the territory from Poplar Bluff to Texarkana including branch line operation? A. You want to include the branch lines which I have supervision over at the present time?

Q. Let me withdraw that question. Over what territory do you have supervision? A. I have supervision over the Hoxie subdivision, Poplar Bluff to North Little Rock, Doniphan subdivision, Neeleyville, Missouri to Doniphan, Missouri, Cotter subdivision, Diaz to Cotter and the Memphis subdivision from Bald Knob to Memphis and the Hughes subdivision from Crip Junction to Hughes and the D. K. and S. Railroad.

Q. Then, the territory from North Little Rock to Texarkana is not under your supervision as a trainmaster? A. The only thing is that I am a trainmaster of the Arkansas Division and North Little Rock to Texarkana is a part of the Arkansas Division.

Q. Well, is it under your supervision? A. But it is not under my supervision.

Q. Is that under the supervision of another trainmaster? A. It is under the supervision of another trainmaster.

Q. On the territory over which you have supervision, how many local trains are there? A. All local trains not including the D. K and S., eight local trains.

Q. Eight local trains? A. Yes.

Q. And how many through freight trains are there over all of this territory? A. There are in this territory at the present time twenty pool crews between Poplar Bluff and North Little Rock and five pool crews between Memphis and North Little Rock.

Q. Are there any through freights from Cotter to Memphis over which you have supervision? A. Have four pool crews and what we call the White River run.

Q. Now, when you have four pool crews, does that mean there are four through freights operating daily over that territory? A. No, sir. We have only two through freights operating between Cotter and Memphis, White River Division.

Q. How many through freights do you have between Memphis and North Little Rock daily? A. We have four through freight trains operating between North Little Rock and Memphis.

Q. That is two each way? A. Yes, sir.

Q. Two each way each day? A. Two each way each day.

Q. How many between Poplar Bluff and North Little Rock? A. We have at the present time, if I am not mistaken, I would say we have twelve between Poplar Bluff and North Little Rock, six each way.

Q. And you said you had eight locals over this territory? A. Eight locals.

Q. And you rode five different trains all of which were in through freight service? A. Let me correct that statement to clarify it to you, Mr. Ross. At the time of June, 1966 in which these trips I made commenced, we did not have the number of locals that we have at the present time. We only had overall four locals at that time.

Q. Would these include the Cotter to Newport local, the Newport to Cotter local and the Newport to Guion local or turn-around, the Newport to Guion turn? A. Jurisdiction of the Cotter to Diaz territory was changed December the 1st, 1966 and I was assigned that territory.

Q. Prior to that time you had jurisdiction over only four regularly run locals? A. That is correct.

Q. You mention in your statement that one movement from North Little Rock to Texarkana involved one stop for the purpose of inspecting for a reported hotbox. Who reported that hotbox? A. The head brakeman at the head end reported to the conductor via radio that he thought that he saw smoke coming from a car and it might be a hotbox so a stop was made to determine the cause of the smoke and it was found to be a sticking brake.

Q. And that sticking brake I take it had to be disconnected before the train could continue? A. The procedure that he did was to reach underneath the car and turn a valve which cut the air brakes out from this car and then pull a lead rod and bleed the air from the reservoirs releasing the brake which was about a four minute job.

Q. But this did have to be done before you could continue? A. Yes.

Q. You make reference in your statement to some observations made by Mr. Austin on the run I believe from Poplar Bluff to Dupo, Illinois. Now, you didn't run on those trains, did you, that Mr. Austin rode on? A. No,

sir, I only rode to Poplar Bluff yard and Mr. Austin relieved me at that point.

Q. You mentioned also at Page 38 of your statement at the top of the page "the final trip on which I rode as an observer took place on July the 20th, 1966 when I rode train No. 62 from Texarkana to North Little Rock". How did you get to Texarkana to make that trip? A. You mean when I rode 62 out of Texarkana?

Q. Yes, sir? A. I rode train No. 7 from Little Rock to Texarkana.

Q. You didn't include a report on that run in your statement, did you? A. No, sir, I did not. That was only a means of transportation to that point.

Q. These runs were made in June of 1966, weren't they? I believe there was one in July and the others were in June? A. I show a train No. 62 on 7-20-66.

Q. That is the one you rode in July? A. Yes, sir, but I am thinking that was probably, I am sure an error in the preparing of this report. The 7th and 20th I think can be an error. I am sure it is.

Q. When do you think it was then? A. Because I did not ride train 62 July the 20th of 1966.

Q. The track from Poplar Bluff to Texarkana is Missouri Pacific main line track through Arkansas, is it not? A. Yes, sir, I would say it is the main track.

Q. You have other track or the Missouri Pacific has other tracks in Arkansas as they refer to as main line track? A. That is correct.

Q. But the Poplar Bluff to Texarkana is a more highly traveled of any of the track in Arkansas of the Missouri Pacific? A. I would say it would be, yes, sir.

Q. What were the weather conditions during these runs on which you made this survey? Do you recall? A. The weather conditions on most trips were normal such as clear and early a. m. on train 61 of the 14th was foggy, ground fog in some areas.

Q. And, of course, the runs being made in the Summertime you weren't troubled with any snow or sleet or ice or anything of that nature? A. No, sir.

* * * *

Redirect Examination,

By Mr. Light:

Q. Mr. Alcorn, train No. 7 that you rode to Texarkana in preparation for riding back on one of the observation trips is a passenger train? A. Yes, sir, that is correct.

Q. Do you know Mr. Daffron, an engineer for Missouri Pacific? A. Yes, sir, I am acquainted with him.

Q. Have you had an opportunity to review the testimony he has filed in this lawsuit? A. Yes, sir, I have read his testimony.

Q. Do you recall his testimony that pertains to rocks falling on the track on the White River run? A. Yes, sir, I read it in the testimony.

Q. Is that an experience that you have had as trainmaster on this territory? Is that a difficulty you have experienced? A. Yes, sir, we do experience that difficulty some in the cliff area.

Q. Has it been your experience since you have been trainmaster on this territory that trains have hit those rocks? A. Yes, sir. We have had two incidents this year where we have struck rocks with train 201.

Q. Is the consist of the crew of that train six men? A. Yes, sir, it is a six man crew.

Q. And they hit the rocks before they stopped? A. Yes, sir, that is correct.

Q. Now, have you had any reports since you have been trainmaster on that territory from train crews that they encountered falling rocks and managed to stop before hitting them? A. No, sir, we have had no such information and had there been such a case, I am sure it would have been known because usually the rocks falling from

cliffs and such as one time in the past here about three weeks ago we had some juveniles throwing some rocks over cliffs and, if they would have stopped before striking the rocks, the rocks were of such size and weight that I do not think that the train crew could move the rocks without some assistance of the maintenance of way department.

Q. When a train stops to avoid striking rocks or anything else on the right-of-way, is that information incorporated into the conductor's report? A. Yes, sir, it is.

Q. Do you see the conductor's reports? A. Yes, sir, we look at the 2704's.

Q. So you, therefore, in your job would have an opportunity to know if the train had stopped short of hitting rocks? A. Yes, sir, we would.

Q. Are you familiar with the shipping operation at Myersville that Mr. Daffron refers to? A. Yes, sir, I am.

Q. Is the switching done at Myersville on both the north and the south movement there? A. The pulling of loads and the spotting of empties to the quarries are always done on the north bound trip.

Q. And on what side are signals passed on that north bound trip? A. On the engineer's side.

Q. Does the D. K. and S. Railroad perform switching operations at Kensett on Missouri Pacific tracks? A. Yes, sir, they perform switching on the track which are switched jointly by our main line local crew.

Q. What size crew does the D. K. and S. use for those switching operations? A. Uses a conductor, a fireman-brakeman, one man, and an engineer.

Q. This is a three man crew? A. That is a three man crew and while moving between stations, the fireman-brakeman acts in the capacity as a fireman and while doing station switching or switching on line, he is on the ground performing the duties of a brakeman.

Q. Now, does the Missouri Pacific forces do switching

operations at Kensett over the same tracks that are used by the D. K. and S.? A. Yes, sir, they do.

Q. What size crew is employed by Missouri Pacific for that purpose? A. A six man crew.

Q. Mr, Alcorn, you indicated that you felt there is some error in the Exhibit that reflects one or more of the runs that you made and recorded information. Would you tell me what appears to be in error? A. It appears in error that the 7th and 20th of 1966 was train No. 62. I am sure if the record were checked, you would find it would be the 6th, 20th, 1966.

Q. Then, it is the date that is in error? A. Yes, sir, the date is in error.

Q. Do you recall riding train No. 62 during the Summer of 1966? A. Yes, sir, I rode train 62 on 6-20-66.

Q. Is there any other information contained in that Exhibit pertaining to the runs you made that appears to be erroneous in any way? A. I have studied them and that is the only error that I can find.

* * * *

Recross-Examination,

By Mr. Ross:

Q. Mr. Alcorn, does the conductor enter all delays on his 2704 form? A. Rule 330 requires the conductor to show all delays of five minutes or more on his delay report which is entered in his delay time slip form.

Q. If the delay were not of five minutes duration, then it would not be entered on his delay report or 2704 form? A. That is correct in most cases.

* * * *

PLAINTIFF'S EXHIBIT NO. 9—**Testimony of William T. Ray.**

My name is William T. Ray. I am employed by the Missouri Pacific Railroad Company as Assistant Trainmaster with headquarters at Crane, Missouri.

I was first employed by the Missouri Pacific in July of 1953 as a Telegrapher for the Palestine Division with headquarters at Palestine. In August of 1963 I became a Dispatcher for the Palestine Division, and in November of 1965 I was promoted to Assistant Trainmaster with headquarters at Crane, Missouri.

The extent of my participation in the survey of freight train operations on the Missouri Pacific is indicated by the summary data which appears in Exhibits PX 16 and PX 17. On May 25 I rode as an observer on the Caboose of Train No. 201 between Kansas City, Cotter and Memphis. The train crew between Kansas City and Crane consisted of a conductor and two brakemen. On the remainder of the movement from Crane to Cotter and from Cotter to Memphis the train crew consisted of a conductor and three brakemen. On the movement from Kansas City to Cotter the train made one stop for the purpose of setting-out cars, consuming 30 minutes in the process. Four stops were made for other purposes. The movement from Cotter to Memphis was essentially the same with two stops for setting-out, picking-up or switching requiring a total of 30 minutes and four stops for other purposes. My observations on these two freight runs indicated that the portion of the run made with a conductor and two brakemen was as safe as the run made with a conductor and three brakemen.

I also rode as an observer on four local freight trains on June 27, 28, 29 and 30. These trains operated from Crane to Cotter, from Cotter to Newport, from Cotter to Crane, and from Newport on a turn-around basis as shown by the lines of Exhibit PX 16 relating to these

observation trips. These local freight trains operated in much the same manner as other local freight trains on the Missouri Pacific in territory outside the State of Arkansas where the train crews consist of a conductor and two brakemen or a conductor and one brakeman. Train crews of this latter size are entirely adequate for safe operation in local freight service.

As Assistant Trainmaster I am responsible for the supervision and instruction of train and engine crews in this Division and in performing these duties I ride about 10 trains per month. About 80% of the time I position myself in the lead locomotive, and the balance of the time I ride in the caboose.

During the strike on Missouri Pacific in March and April of 1966, I worked as a switchman in the Metropolitan Kansas City area with a four-man switch crew. The other switchman was a bridges and buildings supervisor, the foreman was a general road master and the engineer was a mechanical foreman. We handled as many as 59 cars in a single movement, did considerable switching over public crossings, and were not involved in any crossing accidents or personal injuries of any sort.

INTERVENORS' REBUTTAL EXHIBIT NO. 9—

Cross-Examination,

By Mr. Ross:

Q. State your name and address, please sir? A. W. T. Ray, 499 East Hadley, Aurora, Missouri.

Q. What is your educational background, Mr. Ray? A. I completed high school and two years of junior college.

Q. Where was that college? A. Tyler Junior College at Tyler, Texas.

Q. What was your course of study at Tyler Junior College? A. Just a business administration, a general business administration course.

Q. Have you ever had any college courses in engineering or any related fields? A. No, sir.

Q. And you are employed by the Missouri Pacific Railroad Company? A. Yes, sir.

Q. When did you first go to work for that company? A. July 1, 1953.

Q. Had you had other employment prior to that time? A. Yes, sir.

Q. Where had you worked? A. I had worked at Cherokee Hardware, Sportland Incorporated, John Norman Company in Tyler, Texas.

Q. What was the nature of your employment with those companies? A. I was a clerk and salesman at Cherokee Hardware and Sportland and a fine grinder at the John B. Norman Company. This was an optical company.

Q. You ground lenses? A. Yes, sir.

Q. Any other employment prior to going to work for the Missouri Pacific? A. I worked as, well, pulling cars, driving new cars down from the East down to Texas there for a short period of time.

Q. Any other employment? A. No, that was it.

Q. When you were first employed by the Missouri Pacific, you were employed as a telegrapher, I believe? A. Yes, sir.

Q. Then, you became a dispatcher? A. Yes, sir.

Q. Later and then assistant train master? A. Yes, sir.

Q. And you are now assistant train master? A. Yes, sir.

Q. Of the Eastern Division? A. Yes, sir, that's right.

Q. Have you ever had any operating experience as a trainman or an engineer? A. None other than during the strike in, I believe, April of 1966. I worked as a switchman in the yards at Kansas City.

Q. Which switchman's position did you operate as in Kansas City? A. I was the field man.

Q. Long or short? A. The long.

Q. And that position is comparable to the rear brakeman in road freight service? A. Well, I would say it was.

Q. I believe in yard service the pin puller is analogous to the head brakeman in road freight service? A. I believe that is correct.

Q. And the short field man is analogous to the swing brakeman in road freight service? A. That's right.

Q. And the long field man is analogous to the rear brakeman in road freight service. Is that right? A. I believe that is correct.

Q. What type of work did you do during the strike? A. We operated transfer runs between Neff yards in Kansas City and various connections with other railroads.

Q. This I take it then did not involve any industrial switching? A. No, sir.

Q. You were pulling cuts of cars? A. Yes, sir.

Q. From one location to another? A. Yes, sir, basically.

Q. Was this within the yards limits at Kansas City? A. It was in the greater inter-city terminal area.

Q. It was not confined to the yards limits? A. No, not to our yards limits there at Neff yards, no, sir.

Q. Was it confined to the switching limits of Kansas City? A. Yes, sir.

Q. How many days did this strike last? A. Four days, I believe.

Q. And did you work all four of those days as a switchman in Kansas City? A. No, sir, two days.

Q. Two days? A. Yes, sir.

Q. So your experience, your operating experience is limited to those two days? A. Yes, sir, as a member of a train or switch crew, yes, sir.

Q. And this is the only time that you have ever actually operated as a member of the train crew or switch crew? A. Yes, sir.

Q. Have you ever operated as a member of the engine crew? A. No, sir.

Q. Who is the train master on the eastern division? A. The train master with whom I am associated on my portion of the railroad is Mr. W. H. Schiedler, headquarters at Nevada.

Q. What is your portion of the railroad? A. Well, sir, I operate from Carthage, Missouri to Cotter, Arkansas at this time. At the time previous to this, my territory extended to Diaz, Arkansas.

Q. Your headquarters are at Crane, Missouri? A. Yes, sir.

Q. Did the train master with whom you are associated participate in this survey or study which you refer to in your testimony? A. No, sir.

Q. Did anyone else in this area in which you are assistant train master participate in this study or survey? A. Yes, sir.

Q. Who was that? A. John Rogers, road foreman of engines, headquarters in Kansas City.

Q. Who first informed you about this survey or study, Mr. Ray? A. My superintendent, Mr. Dyer.

Q. Did you receive instructions concerning the survey? A. Yes, sir.

Q. What instructions did you receive? A. He informed us that we would be making a study relative to the operation of trains with a crew of four men as against a crew of six men as required by Arkansas law.

Q. For the purpose of giving evidence in this lawsuit? A. Yes, sir.

Q. On behalf of the carriers? A. Yes, sir.

Q. Who picked the runs to be included in this survey? A. Mr. Dyer.

Q. Did he also pick the dates on which you were to ride on these runs? A. No, sir.

Q. Who did that? A. John Rogers and I just figured out a schedule of the way that we could ride from one point to another and make them on consecutive days as much as possible.

Q. Was your complete schedule as far as making these runs made out ahead of time? A. Well, when we were told that we were to make these runs and which runs we were to make and John and I figured out the dates that we wanted to ride them.

Q. Did you figure out the dates ahead of time, all of the dates ahead of time? A. Well, we figured this out the day that we started riding them.

Q. How did you choose the particular runs on which you were to ride? A. Well, our territory covered all the way from Kansas City to Memphis on train 201 as one of the rides and we decided to take that one first because that was our longest one. Then, we doubled back out of Memphis to Newport and began riding the local trains involved.

Q. I believe you rode on all of these runs during the months of May and June? A. Yes, sir.

Q. When, in relation to that, did you receive your instructions as to the survey? A. About two days previous to the first run.

Q. Did you receive written instructions concerning the survey? A. Yes, sir.

Q. What were those instructions? A. They were to tell us in what areas we were to make these observations.

Q. When you say "they"? A. Yes, sir.

Q. Are you referring to the instructions? A. Yes, sir.

Q. Did the instructions indicate on what type of runs you were to ride, whether through freight or local freight? A. These instructions were pertaining to the local and through freight, one set of instructions for each.

Q. What were you to observe on these runs? A. My part was an observer riding the rear end of the train. I was to observe the brakemen and conductors' duties.

Q. How many through freights did you ride? A. One.

Q. How many local freights? A. Four local freights.

Q. One of those local freights was the Newport to Guion turn I believe? A. Yes, sir.

Q. In observing the members of the train crew on this Newport to Guion turn, was there any time during any of the switching operations that all four of the train crew were performing work necessary for the safe operation of this train? A. No, sir.

Q. And your testimony is then that at no time was there a need for all four of these men? A. That's correct.

Q. Did this train switch these two quarries at Myersville on this particular day? A. Yes, sir.

Q. What were the four members of the train crew doing during this switching operation, these switching operations? A. Well, sir, the three brakemen were lining the switches, letting off hand brakes, coupling cars and making the set-out and pick-up. The conductor was making a list of the cars set-out and picked up there.

Q. Then, all four of the men were working, performing some duty in connection with this switching operation? A. Pardon me just a minute. Would you repeat the original question now, sir?

Q. I believe my original question was whether or not at *any time on this Newport to Guion run it* was necessary for all four members of the train crew to be performing some duty which was necessary to the safety of the operation of this train? A. No, sir, I would not say that all four men were necessary for the safety of this train.

Q. But all four of them were working? A. Yes, sir, they were all four working.

Q. Performing their required duties? A. Yes, sir.

Q. On this particular operation, in your opinion how many men does it take to perform the operation safely, the switching operation safely?

Mr. Light: Do you have reference to the train crew now or the train and engine crew?

Mr. Ross: The train crew, the brakeman and conductor.

The Witness: Two brakemen can handle this job safely.

By Mr. Ross: Q. With the aid of the conductor? A. Yes, sir, with the aid of the conductor.

Q. Two brakemen and the conductor can handle it safely? A. Yes, sir.

Q. How many men does it take to pass signals in this switching operation at Myersville? A. In some places it takes two men.

Q. How many cars were you switching at Myersville on this particular day that you made this run? A. I do not recall exactly but somewhere in the vicinity of twenty to twenty-five cars at one time.

Q. I believe there are two quarries there? A. Yes, sir.

Q. Is that correct? A. That is correct.

Q. And you had twenty to twenty-five cars at which one? A. Well, at each one at different times. We switched each separate.

Q. And you didn't have anymore, the engine did not have hold of anymore than twenty to twenty-five cars at any one time at either one of these places? A. Not while switching them.

Q. Where did you position yourself during the switching operations at Myersville? A. I walked alongside of the train where I could observe this operation at both places.

Q. How many men were passing signals? A. The three were passing signals.

Q. And those were I believe you said in answer to one of my other questions that those men were the three brakemen? A. That's right.

Q. You mentioned the conductor was—let me ask you this: What was the conductor doing? A. The conductor was making a list of the empties that he set-out at this place and the loads that were pulled from it.

Q. How many empties did you set-out?

Mr. Light: For the purpose of the record, Mr. Ray, identify what papers you are looking at.

The Witness: I am referring to notes I made on this particular day and they do not reflect how many empties we setout at Myersville; however, it shows that we left

Newport with sixty-one empties and these would include empties for Batesville, Myersville and Guion.

By Mr. Ross: Q. Do you know how many loads you picked up at Myersville? A. Seventeen loads.

Q. The conductor is required to make a load set-out or rather the empties set out and the loads picked up? A. Yes, sir.

Q. Was he busy all during the switching operations performing this duty? A. Most of the time.

Q. Mr. Ray, may I see the notes to which you referred to for the question previously? A. (The witness passed a sheet of paper to Mr. Ross).

Q. Now, are these notes you made at the time? You handed me one sheet here? A. Just a second, please, sir.

Q. Pardon me? A. (The witness passed a page of a small notebook to Mr. Ross).

Q. Are these all the notes that you made? A. No, sir, this has reference to the question that you were talking about.

Q. Could I see all of your notes, please, sir? A. (The witness passed to Mr. Ross a sheaf of the leaves of a small notebook).

Q. Now, this one sheet which you gave to me, I don't see a number on it but I believe it is what is referred to as 2704 report? A. Yes, sir.

Q. Now, this was made by you or was made by the conductor? A. That was made by the conductor.

Q. Pardon me just a minute while I look through these notes, Mr. Ray. A. All right, sir.

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Q. And the 2704 (passing back to Mr. Ray the documents he has passed to Mr. Ross). Mr. Ray, in your notes I see where you referred to a saw-by. I believe your train met train 202. Do you recall that? A. Yes, sir.

Q. What was the procedure for that saw-by? Tell us what a saw-by is? A. All right, sir.

Q. And explain the procedure? A. This saw-by was occasioned by train 201 having more cars in than the siding at Ore would hold. Train 201 headed in the siding at Ore and pulled down to the south switch and stopped. This left a portion of the train hanging out the north switch on the main line. Train 202 came up the main track until it was between the switches at Ore. Then, train 201 headed out the south end of Ore, lined the switch behind and proceeded on and train 202 proceeded when we cleared the switch at the north end of the siding.

Q. Train 201 then was short enough that it could clear each end of the passing track or siding? A. No, sir. It was train 202.

Q. 202? A. Yes, sir.

Q. 202 remained on the main? A. Held the main between the two switches.

Q. And 201 was on the siding? A. Yes, sir.

Q. Did either one of these trains have to provide flag protection at this location? A. No, sir.

Q. The train pulling into the siding, part of it which was still on the main line, part of the train remaining on the main line? A. Yes, sir.

Q. Did not have to provide any type of flag protection? A. Well, yes, the head brakeman on train 201 flagged train 202 and informed the engineer that the rear end of train 201 was hanging out on the main line.

* * * *

Redirect Examination, by Mr. Light.

Q. Mr. Ray, have you had an opportunity to read the testimony of any of the witnesses for the intervenors, that is, the Railroad Brotherhoods that have been filed in this case? A. Yes, sir.

Q. Which witness or witnesses? A. Only one, that of Arthur Boyd, the engineer.

Q. Is Mr. Boyd an engineer on the territory that you discharge your duties on? A. Yes, sir.

Q. Does Mr. Boyd describe his participation in switching operations at Batesville? A. Yes, sir, he does.

Q. Are you familiar with the conduct of those operations? A. Yes, sir.

Q. How many men are assigned to the train crew that conducts those operations? A. Six men at this time.

Q. Has it been different in the past? A. Yes, sir, we have operated with four men.

Q. Why has the crew been increased? A. Because of award 282. Excuse me.

Q. Would you like to amend that answer? A. I would like to include something else.

Q. All right? A. And also we need to handle more cars than is allowable under the Arkansas Full Crew Law when operated with less than a full crew.

Q. In other words, the traffic is heavier and you now handle more than twenty-five cars? A. Yes, sir.

Q. Now, what size crew was used at Batesville when less than twenty-five cars were being handled? A. Previously we used four men.

Q. Did you have many opportunities to observe that switching operation conducted by four men? A. Yes, sir.

Q. Was there ever any occasion to your knowledge to add additional men to that four man crew to perform work that the four man crew could not do? A. No, sir.

Q. Is a locomotive with single control sometimes used for that switching operation? A. Yes, sir.

Q. What does the crew do when they have a locomotive with single controls with respect to conducting the operations so that signals can be passed on the engineer's side? A. If the engineer is turned the right way where the engineer will be on the side that most of the switching is done, they go ahead and operate in a normal manner. If the engine is turned the opposite direction, we turn the engine on the wye to place the engineer on the side that we do most of our switching from.

Q. How many sets of train orders are customarily issued

to a single train? A. There is no limit to the number that can be given. Generally—

Q. I think perhaps you misunderstood my question. I was not asking about how many separate orders there might be. I was asking about how many sets of orders are issued to each train crew? A. There are four sets issued to each train.

Q. To which members of the crew or which location on the train? A. Two sets of orders are handed to the engine crew and two sets to the crew on the caboose.

Q. In the switching operation that you and Mr. Ross discussed on the local that you rode in connection with your testimony that has been filed, you indicated that all four of the train crewmen were occupied with their duties during the switching operation? A. Yes, sir.

Q. Now, by that do you mean that all four of them were working at all times or that on some occasions all four of them were working? A. On that particular run all three of the brakemen when this switching operation was going on but there are times when the conductor was on the caboose or in the depot doing his work or getting way bills or leaving waybills.

Q. On the paper work that the conductor needs to do in recording the empties picked up and the loads set-out, was there time enough for him to do that on the switching operation you have been talking about while the brakemen were coupling the air and making the air tests before the train proceeded after the switching operation?

Mr. Ross: I object to that as a leading question.

Mr. Light: I will withdraw the question.

Q. Do the notes you made reflect how long the train crew was at these two quarries during the switching operation that you observed? A. Yes, sir.

Q. How long? A. Forty-five minutes.

Q. Now, that is the amount of time that elapsed between their arrival at the place where they were going to switch

the two quarters and the time the train departed after that was done? A. Yes, sir.

Q. How much time was required of the conductor to prepare the paper work that he was required to do in connection with that switching operation? A. About twenty minutes.

Q. Was part of the forty-five minute period occupied by the brakemen coupling up the air and making the air test before the train proceeded away from that point? A. Yes, sir.

Q. About how long did that operation require? A. Around ten minutes.

Q. Does the form that Mr. Ross examined after you supplied it to him reflect who the engineer was on that local? A. Yes, sir, Mr. Daffron.

Q. You testified that you rode for the purposes of recording this information, one freight train. Is that correct? A. One through freight train.

Q. Was that one or more runs on that particular train? A. That was actually broken up into three different runs, the complete trip.

Q. This train ran from Kansas City to Memphis? A. Yes, sir.

Q. And three different crews took it through on that entire run? Is that correct? A. Yes, sir. There was the train crew which came out of Kansas City, ran through to Cotter, Arkansas, with the pick-up of a third brakeman at Crane, Missouri.

Q. I believe you have already testified how that worked. After you got to Memphis now what did you ride back? A. I deadheaded back out of Memphis on train 202 to Newport.

Q. Now, did you ride that train for the purpose of recording information here? A. No, sir.

Q. Are the trains that you rode for the purpose of reporting the information that is in your testimony typical runs in your district? A. Yes, sir.

Q. Do your normal duties as an assistant trainmaster require you to ride trains? A. Yes, sir.

Q. What was the difference, if any, in the duties you performed on these runs that you have testified about and the runs that you normally make day in and day out in the discharge of your duties? A. The only difference was that I made notes on this run where normally I don't.

Q. How many trains each day does Missouri Pacific run as through freights from Kansas City to Memphis? A. Only one each day through my portion of the railroad.

* * * *

Recross-Examination,

By Mr. Ross:

Q. Is there also a through train each day from Memphis to Kansas City? A. Yes, sir.

Q. So this would be two through trains? A. Yes, sir, one in each direction.

Q. One in each direction? A. That's correct.

Q. Have you ever operated as a conductor? A. No, sir.

Q. Have you ever filled out the reports that it is necessary for the conductor to fill out concerning these runs? A. No, sir.

Q. The 2704 report which you showed me and referred to is not the only report that the conductor fills out, is it or do you know? A. No, it is not.

Q. I believe you said in answer to one of Mr. Light's questions that the train engine crew are subject to receiving any number of train orders pertaining to the particular run they are operating? A. Yes, sir.

Q. Is there more than one location at which these train orders may be received? A. Yes, sir, at any open train order office.

Q. And they may receive any number from anyone of these open train order offices? A. That is correct.

Q. Mr. Ray, were you on the train operating in Bates-

ville when Mr. Gillian lost an arm, Mr. Gillian who was a member of the crew lost an arm while performing his duties? A. I was not in Batesville the day that that happened. Now, that is Gilliland, G-I-L-L-I-L-A-N-D.

Q. Do you know the crew consist of that train on that particular day? A. Yes, sir.

Q. What was it? A. Engineer, two brakemen and a conductor.

Q. I believe you said you ride an average of ten trains per month? A. That would be a minimum.

Q. In your statement you say "I ride about ten trains per month and about eighty percent of the time I position myself in the lead locomotive". So according to these figures about eight trips per month you would be riding in the locomotive? A. Yes, sir.

Q. And about two trips per month you would be riding in the caboose? A. That ratio would be about right.

Q. So about two trips per month you observe the train crew in its operations over at least one run in your territory? A. As a minimum. Actually when I am riding the engine and on trains that perform switching and all, I get out on the ground and observe the entire crew as far as I can see in their operation.

Q. How many different runs are there over the territory over which you have jurisdiction? A. At the time this study was made or presently? There has been a change.

Q. Both? A. Well——

Q. Take it at the time this study was made first? A. Eight when this study was made and at the present time six.

Q. Now, in this eight figure are you counting the Kansas City to Memphis through freight as one run? A. One run and going back would make two.

Q. When you ride these trains, do you usually ride from Kansas City to Memphis or do you usually ride only a part of this run? A. Only a portion of it.

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Re-Redirect Examination,

By Mr. Light:

Q. Was it your duty to investigate the incident in which Mr. Gilliland was injured? A. Yes, sir.

Q. Did you investigate that incident? A. Yes, sir.

Q. Very briefly tell what happened? A. As best we can determine, Mr. Gilliland somehow got under a hopper car of feed on the compress track at Batesville. The engine had hold of two cars and he apparently was riding the rear end of the first car which was on the engineer's side.

Q. Did he fall or somehow get off of that car and under the train so as to have his arm severed? A. Yes, sir. We do not know how that happened, but somehow he got under the rear car.

Q. Is this function that he was performing of riding that car a job that some member of the train crew would be performing whether the crew was composed of four men or six men? A. Yes, sir.

Q. Is that the only injury to an employee that you recall that occurred during switching operations at Batesville when a four man crew was being used?

Mr. Ross: I object to that as being leading.

Mr. Light: I will rephrase the question.

Q. Do you recall any other injury to an employee during switching operations at Batesville when a four man crew was being used? A. No, sir.

Q. Do you recall any crossing accidents that occurred at Batesville during switching operations using a four man crew? A. No, sir.

Q. About how long were switching operations conducted at Batesville with a four man crew while you were associated with that territory? A. Approximately six months.

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Re-Recross-Examination,

By Mr. Ross:

Q. And this crew has been increased because of the increase in the number of cars handled by this train? A. That's correct.

Q. How long does it normally take to switch Batesville, to perform all of the switching in Batesville? A. From four to eight hours.

Q. Would you agree, Mr. Ray, that an increase of the size of the crew speeds up the switching operations in Batesville? A. Yes, it speeds them up.

Q. At the location where Mr. Gilliland's accident occurred, are there any close clearances? A. Yes, sir.

Q. Is it dangerous for a man to ride the side of the cars at this location? A. Possibly.

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PLAINTIFFS' EXHIBIT NO. 10—
Testimony of J. A. Austin.

INTERVENORS' REBUTTAL EXHIBIT NO. 10—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 11—
Testimony of J. W. Dent.

INTERVENORS' REBUTTAL EXHIBIT NO. 11—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 12—
Testimony of L. J. Brupbacher.

INTERVENORS' REBUTTAL EXHIBIT NO. 12—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 13—
Testimony of B. E. Helvey.

INTERVENORS' REBUTTAL EXHIBIT NO. 13—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 14—
Testimony of R. R. Thomas.

INTERVENORS' REBUTTAL EXHIBIT NO. 14—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 15—**Table.**

PLAINTIFFS' EXHIBIT NO. 16—**Table.**

PLAINTIFFS' EXHIBIT NO. 17—**Table.**

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 18—
Message From President of United States.

PLAINTIFFS' EXHIBIT NO. 19—
Report of Presidential Railroad Commission.

PLAINTIFFS' EXHIBIT NO. 20—
Award of National Mediation Board.

PLAINTIFFS' EXHIBIT NO. 21—
Award of Board of Arbitration.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 22—
Testimony of John G. German.

My name is John G. German. I am presently employed as Chief Mechanical Officer of the Missouri Pacific Railroad and The Texas and Pacific Railway, including their wholly and partly owned railroad subsidiaries (See Ex. Page 1).

I received a degree in Mechanical Engineering from Case Institute of Technology at Cleveland, Ohio in 1943. Presently I am a Member of the American Society of Mechanical Engineers, the General Committee of the Mechanical Division of the Association of American Railroads, Member of the Executive Committee of the Locomotive Maintenance Officers' Association, and Chairman of the AAR Locomotive Rules Committee.

I joined the Great Northern Railway (See Ex. Page 2) as Assistant to the Master Mechanic at Spokane, Washington in 1943 and have served continuously in railroad Mechanical Departments ever since. On September 1, 1961, I left the service of the Great Northern as Superintendent

of Motive Power to accept appointment to my present position with headquarters at St. Louis, Missouri.

During my railroad career, I have been actively engaged in the design, rebuilding, maintenance and operation of steam, diesel-electric and electric locomotives; freight and passenger cars and work equipment. During this railroad career I have held a number of positions through which I have had very close contact with the motive power.

From 1943 to 1945, I was Assistant to the Master Mechanic on the Great Northern. My duties and responsibilities involved steam locomotive redesign work and heavy repairs and operation, diesel-electric locomotive repairs and operation, including the training of enginemen.

From 1945 to 1955, I was Traveling Engineer on the Great Northern, supervising enginemen in the operation of coal and oil burning steam locomotives and diesel-electric locomotives on mountain grades, rolling terrain and prairie country. I was also responsible for testing design and modifications on both steam and diesel-electric locomotives, inspecting the condition of motive power and scheduling such power for necessary repairs.

From 1955 to 1958, I was Master Mechanic on three large divisions of the Great Northern, having direct supervision over locomotive maintenance shops, motive power and enginemen.

From 1958 to 1959, I was Assistant to Chief Mechanical Officer of the Great Northern and was in charge of all shops and motive power repair programs.

From 1959 to 1961, I was Superintendent to Motive Power. I was responsible for the design of motive power, the acquisition of new locomotives, retirement of obsolete locomotives, programmed modifications for improvements on existing locomotives and testing new designs.

From 1961 to date, as Chief Mechanical Officer of the Missouri Pacific, I oversee the acquisition and retirement of motive power, repair programs, modification programs

and general assignments. I have personally consummated the detail of purchase of 318 diesel-electric units since coming to the Missouri Pacific.

During this career as supervisor and officer, I have had the opportunity to become familiar with and perform the duties of a locomotive fireman and engineer on electric, steam and diesel-electric powered units, also as switchman, brakeman and conductor.

At the present time, I am in complete charge of the Mechanical Departments of the various railroads known as the Missouri Pacific Lines operating in twelve states with locomotive and car shops at various key points, including the large mechanical facilities at North Little Rock, Arkansas. There are 4950 employes operating under my direction.

Foreword.

I shall trace the change in motive power in the State of Arkansas and elsewhere from the period of early steam days to the present time. In so doing, I shall also point out the differences between the types of power and how improvements have brought about a more reliable and safer operation.

I shall refer to certain maps, pictures and other data appearing in an exhibit prepared under my direction and supervision which has been identified as Exhibit PX 23.

Development of Steam Power.

Steam locomotives were originated in England with the first successful unit being built by Richard Trevithick in 1803-04.[1] Development of this type of power was followed closely by aspiring engineers on both sides of the Atlantic. The first steam locomotive to pull a train in the United States was the "Best Friend of Charleston" on

[1] p. 17, **Iron Horses**, by E. P. Alexander, Norton & Co. New York 1941.

the Charleston & Hamburg Railway in 1830.[2] An exact reproduction is shown on Ex. Page 3-a I took in 1948—the original blew up in 1831 when the fireman tied down the safety valve to stop the noise. It was built by West Point Foundry, carried 50 p. s. i. steam pressure and had 6″x16″ cylinders and 54″ drivers. It developed 400 pounds of tractive effort and hauled 4 to 5 cars up to 21 m. p. h. Eventually massive steam locomotives were built and used in America that could handle passenger trains up to 127 m. p. h. or could develop 135,575 lbs. tractive effort in freight service.[3]

Fuel, of course, was dictated by availability. Wood was popular at first but later as it became scarce it was supplanted by more easily hauled coal. Apparently the Missouri Pacific lines used wood on some runs until the 1880's. One of our first coal burners was a Ten-wheeler built in 1869. The coal fields in Illinois and Kansas made this fuel readily available. Our records of conversion from coal to oil are very sketchy but The Texas and Pacific was already converted by 1916 and the Missouri Pacific started conversion prior to 1923 and continued until about 1950. The last steamers to be retired were coal burners operated in the Illinois coal fields until April 1955.

During the century and a half of steam locomotive operation there was a constant redesign and development of motive power. Traffic demands constantly called for greater tractive effort and horsepower which in turn demanded better materials, greater boiler pressure, larger components, and more efficient appurtenances.

Principle of Steam Locomotives.

An operating schematic of the steam locomotive is shown on Ex. Page 3-b. Flames and hot gases in the firebox

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[2] p. 42, **Iron Horses,** by E. P. Alexander. Norton & Co. New York 1941.

[3] p. 387, Table 18, **The Steam Locomotives in America,** by A. W. Bruce. Norton & Co. New York 1952.

and combustion chamber pass through the boiler tubes or flues to generate steam. The steam collects in the steam dome then passes through the throttle and the superheater tubes inside the flues to further raise its temperature and dry the steam. The steam then flows from the discharge side of the superheater header to the valve chest through ports to cylinder and piston. The force of expansion of the steam against the piston is transmitted through the piston rod, main rod, crankpins and side rods to turn the driving wheels. At the end of the stroke the steam is exhausted through a nozzle in the front end or smoke box. This exhaust steam goes to the atmosphere through the stack and in so doing induces a draft on the firebox which pulls the products of combustion through the flues to the atmosphere. This draft is so strong that it will pull combustion air up through the grates and thick firebed.

The steam locomotive reached its maximum size about 1939. Its physical dimensions were limited in width and height by the clearance of the structures above the rail. There was an optimum flue length—beyond that the efficiency dropped off as the gases cooled off.

Steam Locomotive Refinements.

As traffic increased so did the size of the locomotives. Refinements were placed on them to better handle the increased demands of the service and make the working conditions better for crews.

Carbon arc headlights replaced oil lamps and in turn were replaced by electric bulb.

Crosshead water pumps were replaced by live and exhaust steam injectors and steam actuated feed water pumps to make a reliable feed water service with lower thermal shock.

Arch brick, thermal syphons, and circulating syphons increased fire box efficiency. Metals with improved physical properties plus new welding techniques permitted

stronger boilers and higher pressures and temperatures. Flexible staybolt caps and telltale holes in staybolts made critical areas safer from leakage. Likewise Bachini flue tips reduced leakage at the rear flue sheet. Superheaters increased efficiency.

Lubrication changed vastly from waste packed oil lubricated bearings to high pressure grease fittings. Force feed lubrication protected the steam engine and compressors.

Air brake capacity grew many times with newer style pumps such as the duplex No. 5 and later the 8½ inch cross compound. Air pumps were mounted on the front end to reduce road and ashpan dust to the intake.

Stokers were developed in period of 1905-1920. They became common for heavy locomotives built after 1920. I. C. C. Order 24049 required stokers on passenger locomotives heavier than 160,000 lbs. and freight locomotives heavier than 175,000 lbs. after April 15, 1939. Air operated firebox door openers and steam grate shakers were applied.

Water treatment was a great boon to safe economical steam operation. Foam collapsing troughs or continuous blowdowns reduced foaming of boilers. Steam dryers reduced water carryover to cylinders.

Multiple throttles made control smoother. Power reverse gear greatly facilitated switching movements and control of power.

A booster engine on trailing truck or tender trucks gave added tractive effort at low speed. Roller bearings on all axles and some crankpins made the critical bearing areas safer.

The Missouri Pacific adopted all of these aforementioned improvements as they bought new power and rebuilt older power.

Drawbacks of Steam Power.

The reciprocating steam locomotive was thermally a very inefficient machine, somewhere in the neighborhood of 6 to 7 percent. Many experiments were made with high boiler pressure, multi-cylindered, and other short-lived experimental designs in an effort to increase the steam locomotive's thermal efficiency. Our poppet valve engine 6001 was such an experiment. The advent, however, of the diesel locomotive rang the death knell for the steam locomotive.

In addition to its inefficiency the steam locomotive had other drawbacks. Its boiler was subject to extreme demands in steam flow and heat surges. In addition to thermal stresses it was also subjected to extreme vibration stresses of a large magnitude. Boiler water supply over the engine district was often varied and could range from an extreme sludging condition to that of a corrosive nature on a long distance run. Water conditions at a given point could vary greatly even from day to day account heavy rains and spring run-offs. While the art of water treatment improved greatly through the years, nevertheless there was too much variance in the supply and maintenance costs were high.

Leaking flues, superheater elements, or dry pipes made the engine crew's job very difficult. The boiler would not steam freely and the fire would die down.

The reciprocating steam engine at best was a rather crude machine and it was impossible to balance out all of the forces generated. Vertical unbalanced forces were so great as to cause the drivers to actually lift free of the rail at certain critical speeds and 180° later slam down on the rail with dynamic forces that greatly augmented the static weight on drivers. This action was called dynamic augment and has even been known to cause bent rails to say nothing of the damage to the locomotive itself. Transverse unbalanced forces caused by overhang

of the rods resulted in a nosing action of the locomotive. Long rigid wheel bases caused the steam locomotive to have a "crabbing" motion as it went around a curve. The steam locomotive at best was a hard-riding machine full of vibration and noise. It was not unusual at times for the crew to lose their footing while standing in the cab.

One of the greatest dangers of a steam locomotive was the possibility of boiler explosions. In fact it was the frequency of boiler explosions and the resulting severity of these accidents that brought about the I. C. C. Boiler Inspection Act of 1911. An example of a severe boiler explosion is shown in Ex. Page 4-a. Invariably a boiler explosion was caused by low water. When the water level fell below the top of the crown sheet of the firebox, this stayed sheet would become overheated and weaken, and the pressure of steam above would literally tear it apart like a large firecracker in a tin can (See Ex. Page 4-b). The resulting release of pressure through the firebox would force the boiler vertically off the locomotive frame and tear it completely loose from the locomotive in severe cases. Low water was caused by one or more of several factors. The feed water devices may have failed or the water in the boiler may have foamed and given a false level indication or the water glasses and gage cocks may have been plugged with sludge and given a false indication. But more often than not it could have been through sheer neglect by the engine crew to observe and control their water level.

Another serious problem on steam locomotives was the chance for the high pressure steam pipes to burst, particularly in the cab area. Ex. Page 5 shows the right and left hand sides of one of our 2200 class locomotive cabs. Practically all of the piping shown therein was high pressure steam which was subject to stress and vibration. In addition there was the chance of a side rod or crank-pin failure which would pierce the throat sheet of the

firebox and cause a large volume of steam to burst into the cab and scald the crew.

In the event of derailment the engine crew was in a particularly critical position inasmuch as jackknifing between the engine and tender would crush the cab or a burst steam pipe would scald the crew before they could escape.

Visibility from the cab was considerably restricted. In the first place the cab was located between the long barrel of the boiler and the wide tender. Narrow front windows (see Ex. page 5), barrel of the boiler and high mounted running boards made view of the track immediately in front of the locomotive and around curves completely obscured. Rear cab windows were of no value in looking backward except on a few older small yard switchers with sloping tender shells. Add to this an adverse wind direction and a cloud of smoke and steam and it is no wonder the engine crew had to hang halfway out the side cab windows to see where they were going.

The Annual Reports of the Director of Locomotive Inspection to the Interstate Commerce Commission have shown the accident and casualties caused by the failure of parts or appurtenances on locomotives since 1912. Ex. page 6 tallies these figures for steam locomotives, boilers and tenders from 1912 to 1955, inclusive, for all the railroads in the United States, for the entire Missouri Pacific, and for the Missouri Pacific in Arkansas only. During this 44-year period there were a total of 17,732 accidents which caused 1,138 deaths and 20,005 injuries—an average of 480.6 casualties per year. This tally reflects the rapid decline of steam power after 1946.

These same ICC Locomotive Inspection Reports for the ten fiscal years 1945-1954 inclusive reveal that there were 2307 accidents attributed to failures of steam locomotives and tenders and their appurtenances. As a result there were 108 persons killed and 2517 injured. The fol-

lowing is a tabulation of the six major causes during this period:

Cause	Accidents	Killed	Injured
1. Handholds	128	2	126
2. Grate shakers	104	-	104
3. Squirt hose	96	-	99
4. Footboards	93	1	92
5. Injectors and connections	88	1	87
6. Boiler explosions	85	68	130

Items 2, 3, 5 and 6 were unique to steam power.

Obviously the boiler explosion had the greatest potential for causing death and injury. It is also of interest that in sixty-two of the eighty-five boiler explosions no contributory cause could be found—apparently they were man failures and not equipment failures!

While the steam locomotive was a wonderful sight to behold as it stormed up the track, it was at best inefficient, difficult to maintain, and unsafe when compared to today's diesel power.

Decline of Steam Power.

From beginning of steam operation until 1950 there were 176,750 steam locomotives placed in service in the United States.[4]

Steam railroading was at its peak in the late 1920's. It is interesting to note the decline of steam power as shown by the Annual Reports of the Section of Locomotive Inspection to the Interstate Commerce Commission:

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[4] p. **46-47. Steam Locomotives in America,** by A. W. Bruce. W. W. Norton & Co. New York. 1952.

Fiscal Year	Locomotives Reported Steam	Locomotives Reported Non-Steam
1927	67,835	951
1937	48,025	2,416
1947	39,578	7,805
1957	3,8[illegible]8	30,740
1965	145	31,410

Ex. Page 7 tabulates the locomotive ownership of the Missouri Pacific Railroad Company as of December 31, 1929, a total of 1,568 units. Ex. Page 8 tabulates the changeover from steam to diesel on the Missouri Pacific Railroad commencing with the acquisition of the first switch engines in 1937 and retirement of the last steam engine in 1955. In 1937 we had a total of 1,208 locomotives of which 1,202 were steam. By the end of 1955 we had a total of 862 diesel locomotives and the steam engines were all removed from service. Obviously our trend paralleled the national dieselization pattern.

The Steam Engine Crew.

The fireman and the engineer on a steam locomotive worked as a team. The engineer was the operator of the engine (See Ex. Page 9-a). However, he alone could not handle the task of operating the locomotive and stoking the firebox with wood or coal. A helper was needed whose basic job was to stoke the boiler and maintain the necessary steam pressure. In addition to the duty of attending the fire, this helper, the fireman, also observed steam gages and water glasses, "worked" the injector to supply water to the boiler, swept and sprinkled the cab floor or "deck" and raked and cleaned the fire.

To hand-fire a steam locomotive the fireman stood on the deck immediately behind the firebox and shoveled coal from the engine tender into the firebox (See Ex. Page 9-b). When I was working on the Great Northern, I spent a con-

siderable amount of time from 1943 to 1958 riding both oil and coal burning locomotives (including hand-fired as well as stoker-fired) in all classes of service. Hand-firing a coal burning steam locomotive was hard work. I would estimate that approximately 40 to 75 percent of the fireman's time was actually spent in hand-firing a coal burner. However, the job of hand-firing was not a continuous performance on the part of the fireman. When he had the opportunity, he would assist the engineer in watching the track ahead of the train and along the left side of the locomotive. In the case of a malfunction or breakdown the fireman assisted the engineer in making repairs.

In addition to his duties in the cab the fireman had the important duty of taking fuel and water and cleaning the fire between terminals. It was common practice to take water one or more times, and sometimes fuel, too, in a 150 mile run.

Each of the new and larger types of steam locomotives that were developed had some improved devices that had not been used on previous types but each of the steam locomotives was operated with the same engine crew, namely, a fireman and an engineer. Improved devices enumerated elsewhere in this testimony brought about a gradual improvement in working conditions and a gradual lessening of physical work performed by the engine crew.

Hand-fired coal burners reached their maximum size about 1910. With the development of stokers the fireman's manual labor was considerably reduced but his job nevertheless remained a stoking job. On oil-burning engines the fireman operated the firing valve and damper and when necessary "sanded" out the flues" and occasionally cleaned carbon from the burner (See Ex. Pages 10-a and b).

The engineer's position on all classes of steam locomotives was at the right hand side of the cab. On hand-fired

coal burning steam locomotives the fireman arranged his activities so that he could observe the track ahead in those areas where the engineer's view was restricted by curvature, smoke and steam. The engine crew was familiar with the territory in which they operated and the fireman would assist the engineer in maintaining a secondary lookout. When he was not engaged in stoking the fireman "rode" on the left seat box. The forward brakeman in freight service also rode the left hand side of the engine or in the brakeman's compartment or cupola on the engine tender.

Thus historically the crew on steam engines in freight service consisted of 3 employees: The engineer on the right side, who was in charge, operated the engine, complied with rules and signal indications and observed the conditions ahead; the fireman, who was occupied most of the time on the deck firing the engine, observed the track ahead when his duties permitted and followed the instructions of the engineer; and the forward brakeman, who sat on the left side or in the tender cupola, assisted in keeping lookout ahead if he was in the cab and always was charged with the duty of observing the condition of the train.

Steam Power in Arkansas.

If you will refer to Ex. Pages 11-a through 16-c, I will trace the type of steam power generally used by the Missouri Pacific Lines in Arkansas throughout the years. During this long period of time our numbering system was changed on several occasions and therefore I shall refer to types of locomotives by the Whyte wheel arrangement system.

Under the Whyte system the first digit refers to the number of "pony" or lead truck wheels, the second digit refers to the number of the drive wheels and the third digit refers to the number of the trailing truck wheels.

Thus a 4-4-0 has four leading wheels (2 axles), four drivers (2 axles) and no trailers. Ex. Page 17 tabulates the different types of steam locomotives operated by the five major carriers in Arkansas.

A brief description is placed under each photo which is self-explanatory. An increase in boiler pressure, cylinder diameter, and weight on drivers or a decrease in driver diameter all increase the tractive effort or pulling power of a steam locomotive.

4-4-0.

Ex. Page 11-a shows the **American** type "Roswell Beebe" which was built in 1871 and pulled the first passenger train on the Missouri Pacific from Argenta, now called North Little Rock, to the Little Red River and return on February 1, 1872. This type of power was developed as early as 1840 and became so popular for light passenger train service of the early days that it was called the American type. This type saw service on our lines until 1935.

4-6-0.

Ex. Pages 11-b and 11-a shows a very popular **Ten-wheeled** type, MP 7505 and MP 2325. This type saw service on the main line as early as 1858. Construction of this type for the Missouri Pacific Lines continued until 1921. Initially they were used for main line passenger or freight service and later relegated to local, branch lines and even yard assignments. According to our records the last Ten-wheeled type was removed from our roster by 1955. A good example of this style of locomotive is the "Hooterville Cannonball" oftentimes shown in the TV series "Petticoat Junction".

2-6-0.

Ex. Page 12-a shows **Mogul** type MP 3607 built in 1884. This particular lot was built 1884-1887 for main line

freight service and later relegated to branch line, local and yard service. The last one was retired in 1947.

0-6-0.

Ex. Page 12-b shows a **Six-coupled** type MP 9301 popular for switching service. Power in this series was built in the period 1872-1921. The last of this series was retired in 1955.

4-8-0.

Ex. Page 12-c shows the **Twelve-wheeled** type MP 1802. Only a few were built in the period 1901-03 and used primarily for heavy local service. The last of this type was retired in 1953.

4-6-2.

Ex. Page 16-a shows a **Pacific** type which started main line passenger service as early as 1902. Other groups were bought during period 1902-25 and they saw service as late as 1952. Originally MP 6001 had a third cylinder between the other two. This particular engine was modernized at North Little Rock Shops in 1942 including disc drivers, poppet valves and conversion to oil. It was used extensively in high speed test runs from Little Rock to Poplar Bluff.

4-4-2.

Ex. Page 13-b shows an **Atlantic** type MP 5508 for high speed passenger service. These were built in the period 1904-07 and some remained in service as late as 1948.

2-8-0.

Ex. Page 13-c was a **Consolidation** type MP 411 which took on the heavy freight work during period 1905-11. Later these engines were relegated to branch line and yard

service. This was the last type of steam locomotive to see service on our line when they were retired from the coal fields of Illinois April 7, 1955.

2-8-2.

Ex. Page 14-a shows a **Mikado** type MP 1423 which was built in the period 1911-25 to replace the Consolidations on the main line. Later these too were downgraded to branch line and local service and all were retired by the end of 1955.

4-8-2.

Ex. Pages 14-b and 14-c shows the **Mountain** type which with the smaller drivers (MP 5201) was used in main line freight and with the larger drivers (MP 5321) was used for main line passenger service. These engines were purchased in the period 1913-30 to handle the heavier trains. Later they were used on secondary freight and passenger service. The last of this type was retired in 1954.

2-10-2.

Ex. Page 15-a shows a **Santa Fe** type MP 1726 used mainly for drag freight service on the hills in Arkansas, Missouri and Kansas. They were built during the period 1916-26 and all were eventually replaced by diesels by 1955.

0-8-0.

Ex. Page 15-b shows **Eight-coupled** type switcher MP 9767 which was developed for greater tractive effort than the 0-6-0 type to handle larger cuts of cars on lead tracks and hump yards. This particular series was built 1924-29 and the last of these units were retired by 1956.

2-8-4.

Ex. Page 15-c shows the **Berkshire** type MP 1919 built 1928-1930. In order to obtain greater firebox capacity it

utilized 4 trailer wheels instead of 2 like the Mikado. This 1900 series of locomotives was later rebuilt into 2100 series Northern type for freight service by our own shops in 1940-42.

4-8-4.

Ex. Page 16-a and 16-b shows the **Northern** type (MP 2125 and 2201) which was the final steam power assigned to high speed main line freight and passenger service. They were built in 1940-43. The 2100 series were rebuilt from the Berkshire type in our own shops. The 2200 series were built by Baldwin. Their size prevented relegating them to branch line service as dieselization took hold and they were retired by 1956.

In addition to the previously discussed types of steam power the Missouri Pacific Lines owned or operated a 4-2-0 class built in 1856, 2-10-0 **Decapods** built in 1918 and 2-10-4 **Texas** built in 1925-29. However they seldom operated over any significant mileage in Arkansas. Other roads operated 0-4-0 **Four-coupled,** 4-6-4 **Hudson,** and 2-10-0 **Decapod,** 2-10-4 **Texas** and also articulateds 0-6-6-0 and 2-8-8-0 in Arkansas. Ex. Page 16-c illustrates KCS 905, **Texas** type, which operated in Arkansas. The Reader Railroad still operates one 2-8-0 **Consolidation** and two 2-6-2 **Prairie** class steam locomotives in Arkansas.

Other-Than-Steam Power.

Modern electric, diesel, and gas turbine locomotives have much the same outward appearance but they differ radically in one important respect. The straight electric locomotive does not carry a prime mover power plant on the locomotive but receives its energy from an outside power source that may be a considerable distance from the locomotive.

The diesel locomotive, the turbine locomotive, and the rail motor cars obtain their energy from a prime mover

carried on the locomotive. Because diesel locomotives are actually propelled in most instances by electric traction motors, they are sometimes referred to as diesel-electric locomotives. Final drives other than electric motors, however, are used including mechanical and hydraulic transmissions. Therefore in my following discussion the term diesel locomotives will be used to refer to any of the units with diesel prime movers. Since the steam-turbine and gas-turbine locomotives are not in use in Arkansas I will not touch upon them any further.

Electric Locomotives.

The Missouri Pacific Lines never had any electrification in Arkansas but did operate the Houston North Shore Railway in Texas and the Coal Belt Electric Railway in Illinois. I have no personal knowledge of any main line railroad having an electrified operation within the State of Arkansas. However to make my story complete on motive power development a brief historical background on electrification may be helpful.

The rapid expansion of local electric streetcar lines and interurbans commenced throughout the nation in the 1880's and 1890's. These interurbans transported freight as well as passengers and in some cases operated under train rules. The first main line electrification in this country was on the Baltimore and Ohio Railroad in 1895. Electrification expanded throughout the nation and reached its peak in track mileage in the late 1920's and slowly dwindled down to use in restricted high density areas on the New Haven, New York Central, Pennsylvania, Illinois Central, and the mountainous districts of the Milwaukee Road.

Ex. Page 18-a shows the diagram of an electric locomotive. The electrical energy is generated at a central power station and is transmitted to the locomotive or car either through an overhead contact wire or, as in the case of the

New York Central, through a third rail conductor. The equipment within the locomotive consists of a transformer or rectifier and the switches and control equipment that operate in response to the engineer's controls to cause the locomotive to move as he so directs. While on the steam locomotive the fireman had as his principal job the stoking of the fire to make available the heat energy contained in the steam for utilization as the engineer directed by his manipulation of the throttle and other controls, on the electric locomotive this conversion of heat into energy takes place at the remote power station, the energy has been transmitted over the power network to the locomotive, and it is instantly available to move the locomotive as the engineer directs. The fireman does not participate in the least degree in this conversion or distribution. He has had no part in assisting the engineer nor is there anything that he can do in the conversion of the electrical energy into the mechanical energy necessary to move the train. The transformers, rectifiers, control equipment and other accessories and appurtenances in the electric locomotive "engine compartment" are enclosed and fully automatic. Insofar as we are presently concerned here, the experience gained with the electric interurban cars and locomotives led to the idea of developing self-propelled rail cars which would be independent of a trolley line.

Rail Motor Car.

With the development and improvements in the gasoline engine, it was natural to try to adapt this engine to rail motive power service. Because of the need for small and economical units for branch line and secondary passenger service a considerable amount of experimental work was done leading to the construction of so-called gas-electric or gas-mechanical motor cars.

The idea of a rail car was not new because ever since railroading had begun the desire for a self-propelled car

which could carry passengers had been in the minds of railroad designers. The propulsion problem however had always stymied their efforts. Steam, compressed air, storage battery driven motors had all been tried unsuccessfully owing mainly to the lack of a good transmission. Two alternatives in transmission were possible—a mechanical drive or an electrical drive.

Starting in 1904 Mr. W. R. McKeen of the Union Pacific tried to work out a practical railway car powered by an internal combustion engine. His transmission was of the gear-changing mechanical type and within the next 15 years about 150 of these mechanical transmission cars in the 100 to 300 horsepower range were built.[5] The Rock Island operated **McKeen cars** in Arkansas. These cars were purchased in 1909-1910, repowered with 200 HP EMC 106A gas-electric drives in 1925-1926 and retired in 1937. The Rock Island previously tried two steam cars in 1907-1908 and two small gas-mechanical cars in 1907 and 1909.

Based on experience with electric traction drive under interurban cars the General Electric Company began its development of the gas-electric car in 1904 and between 1909 and World War I it sold about 100 of these gas cars to the railroads. Ex. Page 19a shows a picture of a gas-electric car, MP 600, built by General Electric in 1911. This 175 HP car saw service on many of our branch lines. Later it was repowered with a 220 HP 106A plant and was finally retired in 1948. Rock Island, Frisco and Cotton Belt also used General Electric cars during this period.

In the period 1924 to 1926 the Missouri Pacific Lines acquired a gas-mechanical drive car shown on Ex. Page 19b which was a **Brill model 55** in the series 601-606, inclusive. These cars only generated 68 HP, and according to our records most were converted to trailers or retired by 1940.

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[5] p. 401-3. **Steam Locomotives in America.** A. W. Bruce. W. W. Norton Co. New York: 1952.

Commencing in 1925 we accepted delivery of five **Sykes gas-mechanical** cars, series 606-610, shown in Ex. Page 20a. Apparently the mechnical transmission of these cars was short-lived since they were returned to St. Louis Car Company 1927-31 and rebuilt into 220 HP Electro-Motive model 106A's with an electric transmission, series 625-629, similar to the 650 series. This particular group of cars was retired between 1948 and 1954. The Frisco operated Sykes cars also.

After the First World War which had interrupted the development of the gas-electric, Mr. H. L. Hamilton organized the Electro-Motive Corporation and in 1923 began production of gas-electric cars similar in principle to those made by General Electric. Generally the car bodies were built by long-standing passenger car builders such as St. Louis Car Company, Bradley Car Company, Pullman, etc. Electro-Motive and other manufacturers produced over 1000 such gas-electric cars from 1924 to 1932. The output of these cars ranged from the original 150 HP to 900 HP. In 1926 the Missouri Pacific Lines acquired five **220 HP EMC Model 106A** cars in the series 650-654 as shown in my Ex. Page 20-b. They were all retired from active service by 1950. The Frisco and Rock Island operated model 106A cars too.

The Frisco and Rock Island operated some **275 HP EMC Model 120** gas-electric cars and the Frisco also had some **250 HP Brill gas-electric** cars with Hall-Scott engines. These were similar in style to the EMC Model 106A.

Ex. Page 21a shows a **400 HP EMC Model 148** gas-electric car MP 661, which type was acquired in 1931 and retired in 1950-51.

The Missouri Pacific Lines tried a **hydraulic transmission** car when they had streamlined diesel motor car No. 670, shown in Ex. Page 21b, built by American Car and Foundry. This car, which was built in 1942, was known as the "Delta Eagle" between Helena and McGehee before its retirement in 1960.

All of the MP 600 series motor cars saw service within the State of Arkansas at one time or another, primarily on branch line passenger trains and in secondary passenger train service. The photographs show typical configurations which indicate compartments to carry passengers, mail, baggage or express. Some operated as single units—others pulled trailers. Ex. Page 24 shows a chronological list of motor car types used in Arkansas by four major carriers (KCS did not operate motor cars).

Some roads experimented with 300 to 900 HP gas-electric freight motors such as the Rock Island 9001 shown in Ex. Page 22a. Larger but similar units 9005 and 9007, which operated in Arkansas, were built in Rock Island shops in 1929, later dieselized and finally retired in 1958. About 1948 they were equipped with steam generators for passenger train service. They were **800 HP EMC twin Model 148** units (two power plants) manned by one operator—the engineer.

The self-contained motor cars were operated by one man—the engineer. The cabs were arranged for one-man operation. The throttle, controller, reverser, brake valve, whistle, bell and other controls were all located convenient for their operation by the engineer-operator (Ex. Page 23). The one-man operation applied to the smallest (68 horsepower) and to the largest (900 horsepower) cars. No fireman was needed and none was ever assigned.

The only development in recent years in rail motor car design is the so-called **RDC (rail diesel car)**, a modern streamlined stainless steel rail car built by the Budd Company (Ex. Page 22b). The motive power of these cars is provided by a pair of 275 or 300 horsepower diesel engines located under the carbody, inaccessible when the car is in motion. RDC cars can be coupled together for multiple unit operation with all of the trailing units responding to the controls from the forward unit. However when two or more units were coupled the weight on drivers exceeded

the 90,000 pound maximum stipulated in the Diesel Agreement and an unneeded extra employe, the fireman, was required on the multiple unit RDC. There was nothing for the fireman to do; the engineer's controls were still the same, the engines were still under the carbody inaccessible to anyone except at station stops. Firemen are no more needed on a multiple car RDC than on a single RDC. While the Missouri Pacific Lines did not acquire any Budd cars, the Rock Island operated them in Arkansas from 1954 until August 1963 as single units.

Ex. Page 24 tabulates the rail motor cars and electric rail cars in service on Class I railroads between 1926 and 1958. These cars, due primarily to their passenger car configuration, were enumerated separate from the locomotive roster. While the number is small in relation to the total locomotive fleet, these types of rail cars played a very important part in the dieselization of the nation's railroads. They were the proving ground for the use of the internal combustion engine as a prime mover. They were the proving ground for the improvement of electric traction drive. Today the nation's largest locomotive builder is the Electro-Motive Division of General Motors, a direct outgrowth of the Electro-Motive Corporation organized by Mr. H. L. Hamilton back in the early 1920's to develop rail cars. With the exception of a few Budd cars the rail motor cars are for all practical purposes extinct from railroad revenue service account obsolescence, scarcity of parts and sharply rising operating costs.

Development of Diesel Power.

During steam locomotive days there were over a hundred different builders. Some only lasted a few years and some were merged into bigger companies such as Alco (American Locomotive Works). Naturally the strongest companies which come to my mind are Alco, Baldwin, and Lima. Other common nameplates flash to

my mind such as Brooks, Cooke, Mason, Rogers, Schenectady, etc. Many railroads built their own steam locomotives.

During rail car days the passenger coach builders such as Bradley, Brill, Pullman and St. Louis Car made the carbodies and applied the power units from an outside engine builder. General Electric, Winton, Electro-Motive, Hall-Scott, McKeen, McIntosh-Seymour, White, Four-Wheel Drive, Mack, and Sterling were commonly known engine builders. The strongest company to grow out of this development was the Electro-Motive Corporation utilizing Winton engines.

It was a natural evolution from rail cars to diesels and Electro-Motive was in the forefront during the twenties, thirties and forties. Alco and Baldwin dabbled in diesels during this period but probably on account of their high sales of steam power they did not get too serious about diesels until the early forties. After World War II, Fairbanks-Morse joined Electro-Motive, Alco and Baldwin as builders of complete diesel locomotives. By late 1958 Fairbanks-Morse had just about stepped out of the new locomotive business. Baldwin-Lima-Hamilton also announced its withdrawal from the locomotive business after more than a century of building motive power. General Electric, who had built electric locomotives for over fifty years and for nearly as long had built first gas-electric rail cars and then diesel-electric industrial switchers and some turbines, decided to move in on the main line locomotive business. Today the big three are Alco, General Electric, and Electro-Motive Division of General Motors. Up to the present time the latter has built over 22,000 units for railroads in the United States plus more than 3,200 remanufactured units.

With just a few builders in the market and a marked demand for compatible power units it was only natural that by 1944 the builders had each laid out plans for

similar models. It is not uncommon to see units of various builders in one consist. It is also not uncommon to see carbody, road-switcher and yard-switcher units in the same consist. The day when each railroad had its unique locomotive design passed with the close of the steam era.

The first commercial diesel switching locomotive was constructed for the Central Railroad of New Jersey in 1925. This was a 300 horsepower box car type unit constructed on two four-wheel trucks. During the next two years eight more of this type of unit ranging from 300 to 600 horsepower in size were placed in service. One of the early units of this type as shown in Ex. Page 26a was the Great Northern 5100 powered by Ingersoll-Rand and built by Alco-GE in 1926.

The early diesel switchers, which utilized available commercial diesel engines, were designed to burn low grade distillate. The builders were trying to adapt engines designed from stationary plant or marine service to railway service. While these type engines functioned fairly well in switching locomotives, the rapid growth of diesel locomotives did not really start until the lightweight engines designed especially for locomotive service were in production.

Demands by the railroads for more and more horsepower and the concurrently rising price of gasoline was destroying the lower operating costs in rail motor car operation.

During the early 1930's a lightweight two-cycle engine was developed and designated model 201[6] by Electro-

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[6] All EMC and EMD engine model numbers are based on the cubic inch displacement of one cylinder. This number is prefixed by a numeral to designate the cylinders in the block and it is suffixed with a letter to show latest revision. Hence a "12-567B" engine is a twelve cylindered engine, each displacing 567 cu. in. per revolution and it is the third version. EMD diesels are model 201 two-cycle with cylinders in line or model 567 and 645 two-cycle with cylinders in a 45° V-bank. Fair-

Motive Division of General Motors (henceforth known as EMD).

By 1934 several articulated streamlined passenger trains were built and gaining national recognition as a new form of motive power. Notable among these trains were the Burlington's "Pioneer Zephyr" shown in Ex. Page 26b and Union Pacific's "City of Salina", both of which were powered by a further refined Winton engine called the 201-A. The design of their power plants followed very closely the gas-electric motor cars which had been successfully operated with a single engine crew member. The controls were all located adjacent to the engineer's position in the cab. The power plant unit was part of the fixed articulated train consist. All of these designs were laid out in such a manner that they could be operated efficiently and safely with one man in the compartment.

During the late 1920's and early 1930's there were several attempts at developing road diesel power. All motor car trains and diesel streamlined passenger trains were more or less a fixed consist and for greater flexibility it was readily apparent that a locomotive which could be detached from the train was needed. The original road locomotive units were of simple box car style with square ends. These units were the forerunners of the streamlined passenger units placed in service in the late 1930's. The success of the passenger diesel locomotive led to the freight diesel.

One of the earliest successful experimental diesel freight locomotives was the four-unit 5400 horsepower model FT demonstrator No. 103 constructed by General Motors in 1939. This locomotive was tested all over the nation by many railroads including the Missouri Pacific. As a re-

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banks-Morse's are two cycle engines with opposed pistons in a vertical plane. Alco's are in-line 539 or V-type 244 and 251 four-cycle engines. General Electric's are V-type four-cycle engines. Baldwin's are in-line four-cycle series VO or 600.

sult of these test runs, orders were placed by practically all of these railroads for similar locomotives. The design of these units, which were of the carbody type, was such that locomotives of various horsepower requirements to suit the train handling needs of the individual railroads could be met by coupling 2, 3 or 4 units together to provide 2700, 4050 or 5400 horsepower locomotives as required.

By the time the first production freight locomotives were delivered to the nation's railroads the Diesel Agreement was already in effect and the fireman's job protected by a formal contract. Hence the design engineers took advantage of his availability to manipulate radiator shutters and cooling fan clutches in the freight locomotive engine room. The designers then turned their efforts toward taking care of other aspects which were not so easily controlled by manual operation. But controlling cooling water temperature was not a task requiring a great deal of attention except on the most adverse terrain. An experienced fireman could set the fans and the shutters at the initial terminal and they would operate over the district with very little additional attention.

Regenerative or so-called dynamic braking became available to any railroad using electric traction. Dynamic braking employs the momentum of the train to cause a braking effort and electrical energy thus produced is dissipated as heat through braking resistors. Blowers were required to force large volumes of cooling air through the braking resistor grids. To assure that the blowers were working properly visual checks were sometimes made by the fireman. With improvement in design this patrolling function was discontinued as a precautionary check of dynamic brake blower motors was found to be unnecessary.

With the advent of early diesel units a new type of locomotive was being placed in service in large numbers.

Railroad mechanics, engine crews and supervisors were not familiar with the diesel locomotive. If the first units placed in service did not perform satisfactorily, repeat orders could not be expected. The locomotive builders suggested conservative standards for operation and maintenance, and since the railroads were not familiar with this new equipment they accepted the builders' standards. As the railroads gained experience in the operation and maintenance of this new type power, more realistic concepts for both operation and maintenance prevailed.

During the operation of the first streamlined passenger trains several roads used so-called "riders" or "maintainers" on the diesel locomotives. These men were shop craft employes. The early streamlined trains were in exacting high speed service. The locomotives were operated long distances between terminals and serviced during a relatively short turnaround time; no spare locomotives were available! There were early development troubles with equipment and a scarcity of qualified maintenance personnel. In order to assure satisfactory train operation the "riders" or "maintainers" were used as engineroom attendants on passenger locomotives. They made minor repairs enroute, determined the work to be performed at terminals and assisted the enginemen. When diesel freight locomotives arrived later, however, the improvements in locomotive design and equipment and the familiarity of the user roads to the operation and maintenance of diesel passenger and switch engines made it possible to operate diesel freight locomotives without riders.

By 1948 the builders had gained sufficient experience so that they started coming out with newer models of freight diesels. Outwardly they had a similar appearance to the original freight diesels but inwardly they were entirely changed. The V-belt drives, gear boxes, mechanical clutches and manual shutters were eliminated. The cooling system was made completely automatic and

practically all of the locomotive accessories were designed to be electrically driven rather than mechanical drive. Most of the gages and instruments to measure locomotive performance unnecessarily placed on early model freight units were eliminated.

Shortly thereafter automatic transition was applied to production model locomotives. This eliminated relying upon the engineer's judgment to properly change connections between the main generator and traction motors with manual transition levers. Since that time there has been further simplification and improvement of the automatic transition feature which adds longevity to the traction equipment and reduces potential road failures.

There was a need on most roads for single unit diesel locomotives to replace older obsolete steam power in branch line service. Diesel yard switchers were not acceptable because of the rigid truck design. A lower cost unit than the conventional freight unit was needed and for local freight service where considerable switching was done a unit with a similar configuration to a diesel switch engine was desirable. The road-switcher type was designed as a compromise between a regular standard diesel switching unit and regular road carbody unit.

The earliest hooded type road-switcher units were constructed about 1937. They were 900 and 1000 horsepower units constructed for branch line service. They performed so satisfactorily that they soon replaced obsolete steam power on many branch line freight, passenger and mixed trains.

As a result of the improvement in power plants, controls and equipment and the trouble free operation of carbody type units, it became evident that a larger hooded type unit could be designed which would have many advantages over the carbody type units for freight service.

With the development of the 1500 horsepower road-switcher type units by various locomotive builders starting in 1948 this type unit was utilized for all classes of

service with the exception of high speed passenger service where streamlined passenger locomotives were already available.

During the past ten years the trend of the American railways has been to acquire only road-switcher type units for road service. There has also been a trend to replace carbody type units as they are retired with hooded type units. Generally speaking the road-switcher type units built in recent years are replacements for older obsolete carbody units which have been retired or remanufactured into the newer style road-switcher type.

In addition to the general purpose four-axle road-switchers that started to become popular in the early 1950's, a six-axle road-switcher called the SD or special duty type was developed for drag freight service and mountain work. In the early 1960's the builders developed road-switchers of 5000 horsepower on 8 axles—actually 2 power plants in one carbody—and they now furnish this style of locomotive up to 6000 horsepower. However the use of these is usually limited to high speed freight runs on rather severe grades. Within the past year there has been considerable revival in interest in the six-axle 3000 to 3600 horsepower road-switchers. As a matter of fact most of the output of the nation's largest locomotive builder is devoted to this particular style of unit.

Principle of the Diesel.

The schematic shown in Ex. Page 18-b illustrates in simple terms how the diesel-electric locomotive functions. The diesel engine which operates in a range from 275 to 1000-rpm drives a main generator. The engineer through controls in the operating cab regulates the distribution of power to the wheels. In addition to the prime mover there are auxiliaries such as cooling fans and blowers, auxiliary power for lights and controls, air compressor, etc.

The schematic shown in Ex. Page 27 explains in more detail the operation of equipment on an EMD F7 carbody freight locomotive. The engineer manipulates the controls within his easy reach to release the brakes, place the controls in forward or reverse direction, as desired, and opens the throttle to not only increase the engine speed, but also to remotely control the high voltage switch gear connection (in the electrical cabinet) of the main generator to the traction motors and cause the locomotive to move. There is an automatic load regulator which matches the engine output for the generator demand in any given throttle notch. As the locomotive speed increases there is an automatic changing of electrical connections of the traction motors to the main generator to obtain optimum performance throughout the speed range of the locomotive. This changeover is called "transition" and is similar in effect to shifting gears in an automobile. As the speed of the locomotive decreases, transition will be automatically made in reverse order.

The modern diesel-electric has three electrical systems. The high voltage system contains the main generator and traction motors with related power contactors or switch gear. This high voltage system is marked "Danger 600 Volts" and is guarded by covers or doors to prevent personal injury. Most high voltage systems are direct current. Some newer locomotives have an alternating current main generator with built in silicone diode rectifiers which send direct current to the motors. D-C motors have the best characteristics for traction purposes.

The low voltage system is really in two parts. An auxiliary generator driven by the diesel furnishes 74 volts D-C current for lights, batteries, radio and control functions. An alternator is built into the main generator or made an auxiliary thereto to develop A-C current up to 175 volts to drive cooling fans and traction motor blowers.

The 74 volt control system remotely operates the high

voltage system. There is absolutely no need for anyone to manually operate a high voltage power contactor under load!

The engine auxiliaries are now all self-contained and automatic in their functions. There are alarms and protective circuits of proven design and reliability for the critical functions.

The diesel locomotive had several admirable qualities that allowed it to totally replace steam power within a relatively short period of time. In the first place it had considerably greater thermal efficiency—in the neighborhood of 26 percent—more than three times greater than a steam locomotive! Another was that two or more units could be coupled in multiple in sufficient numbers and controlled from one station to handle the demands of the traffic without having to "double head".

A third advantage was that component parts of the individual diesel locomotive unit was also on the building block principle and these components could be quickly changed out (to be repaired at a later date) and the unit quickly returned to service. A general overhaul on a diesel locomotive can be consummated in just a few days' time whereas the steam locomotive would lay in the shop from 30 to 45 days.

But the operating characteristics are probably the qualities which most quickly won their way to the railroad man's heart. The diesel-electric locomotive has a very smooth and high starting torque which enables it to start and accelerate heavy trains on adverse terrain whereas the steam engine had uneven torque and would tend to stall or slip under adverse conditions. This same feature greatly reduced vibration in the locomotive and eliminated hammer blows to the rail structure from unbalanced forces. The diesel rides easily and is no harder on the rail than today's large freight cars.

Due to its inherent qualities the steam locomotive could

only utilize its maximum horsepower output between 20 and 40 miles per hour whereas the diesel locomotive can utilize its full horsepower from 12 miles per hour up to its designed maximum speed. This meant that the diesel could accelerate a train more quickly in the lower speed range and better hold the train up to the maximum track speed which, of course, meant considerably reduced running time between terminals.

The diesel has a much longer fuel range and seldom has to take water. It can be quickly inspected and serviced.

All of these qualities blended together made available a locomotive which has a very high utilization factor. On a national basis this in turn permitted less than half as many units to handle more business than was done at the peak of steam engine days and with considerably less capital investment in fixed properties (shops, service stations, etc.).

Refinements in Diesel Power.

My discussion on the development of diesel power brought out many of the major improvements that have occurred in diesel locomotive design such as automatic cooling control, automatic transition, improved dynamic brake cooling, etc. However, there have been hundreds of other improvements that are not so apparent but nevertheless they have been vital to improved capacity, safety, and reliability of the diesel. These improvements are the result of continual research and development by the locomotive builders, service testing by the railroads and a very competitive railroad supply trade market.

In 1936 Eugene Kettering of Electro-Motive began development of a V-type two-cycle diesel engine called the "567". By 1939 it became the standard production model replacing the "201 Winton". During the years to follow it was improved upon many times, but always its building block principles were adhered to so that the latest parts

generally fit all of the preceding models. Model changes were as follows: A in 1941, B in 1946, C in 1954, and D1 in 1959; also turbocharged model D2 in 1959 and D3 in 1962. The sixteen-cylinder version ranged from 1350 HP in 1939 to 2500 HP in 1962.

The horsepower race led to further development of a high horsepower single engine unit. Electro-Motive, for example, broke away from its "567" models with a new model "645" in 1965. Besides many small refinements over the 567, the major difference was the cylinder bore increased from 8½" to 9-1/16" in the same size crankcase plus a new 20-cylindered model which required a different crankshaft. The Alco 244 and 251 engines in the 1940's and 1950's and General Electric in 1960's had similar engine development.

Ex. Page 28 shows the improvements made in the B + B road locomotive line by Electro-Motive Division, the nation's major builder, from 1940 to 1965. It traces the development of the 567 engine through the 567 D3 model, all with 8½" bore, and then the newest model 645 engine. It shows the improvements of the DC main generator models D8 to the D32 inclusive, and then the new AR10 AC Generator. It shows the model changes of traction motors from the D7 to the D77. I chose this example since practically all of our power is now EMD. However, Alco and General Electric have made similar progress. Hence, the following discussion applies to refinements by all of the major builders.

Better metallurgy has permitted longer life at same or less weight per horsepower in vital engine parts such as heads, liners, pistons, crankshafts, etc. Newer foundry techniques have permitted better cooling of cylinder heads and pistons to greatly reduce thermal cracks.

New methods and materials such as used by the aircraft and rocket industries have allowed considerable improvement in the life of turbochargers and thus permit greater output of the engine.

There has been a revolution in the fuel oil, lube oil and filter industries and the improvements in this area are interdependent upon each other. While diesels are now designed to burn a cheaper and lower grade cetane fuel, refining techniques now permit a more uniform quality with hard carbon particles and sulphur content reduced. The lube oils have changed from a straight mineral oil to a heavy duty medium detergent type. Many roads now use a high dispersant type oil which keeps all engine dirt in solution, but the particles are so small they pass between bearing surfaces without causing damage. Filters were originally relatively coarse screens and waste-packed cans which required changing every ten days in the 1940's. Improvements in filters and oils now permit changing on a 30 to 90-day basis. Modern filters are primarily pleated paper throwaway cartridges which trap particles 5-12 microns (a particle of diameter between 0.005 and 0.012 millimeter) in size instead of 25-75 microns of ten years ago. As a result, wear rates have slowly declined in spite of power output more than doubling.

Electrical switch gear was originally quite elementary and air operated. It was common practice to clean and adjust interlocks and contactors every trip. This led to the practice of "tinkeritis" by many crews with resulting locomotive failures which were often man-made. The old adage—"A little knowledge is worse than none"—seemed to apply here. Now we have electrically operated switch gear (with improved contactors and sealed interlocks) of greater capacity and unaffected by moisture, temperature and low control air pressure failures. The sophistication of control circuitry has been tremendous. Program switches eliminate a lot of control wiring as do blocking rectifiers, transistors, etc. Battery voltage is maintained + ½ volt by use of solid state voltage regulator. The old style with many mechanical linkages was lucky to maintain + 4 volts. Thus a more stable and

reliable control system was developed which eliminated adjustments on the road.

Power contactors themselves are vastly changed with greater capacity and reliability. Rotary contactors, like reverser and dynamic brake drums, have been eliminated account tendency to malfunction and requiring manual assistance.

While basically a direct current power plant, the builders came out with an alternating current auxiliary generator in 1948-1950 to drive cooling fans and traction motor blowers in order to eliminate V-belts, drive shafts and manual clutches. In 1965 they came out with an AC main generator for traction purposes. This AC high voltage current is then rectified by silicone diodes into DC current. This eliminates generator brushes and doubles the generating capacity within the same space. Flashovers in the main generator are eliminated.

The improvement in the electrical insulation trade has been tremendous. Indeed it is the secret of how we now take 750 horsepower out of a D77 motor that has the same physical dimensions as a D7 motor which furnished 340 horsepower in 1939. Wiring with high resistance to ground and resistance to high temperature vastly reduces the grounds or short circuits and danger of electrical fires. Insulation is ten times better today than it was 20 years ago.

Wheel **slip** detection was improved to wheel **creep** detection and suppression. Today we apply 2500 horsepower to the rail with less slipping than we had applying 1350 horsepower to the rail in 1943 and with only 9% more weight on drivers. This reduces chances of surge in the train (slack action) and hence reduces possibility of resulting break-in-two which could cause derailment and personal injuries.

Originally there were no filters to the engines, blowers and compressors but as time went on, impingement or

oiled screens were used on carbody louvers and intake to engines and compressors. About 1955 oil bath filters were adapted to engine and compressor intake. In 1960 an inertial air filter system was devised to clean large quantities of air for delivery into the carbody. Part of this air was used to cool the main generator and traction motors and part was filtered again for the compressor and engine use. The net result is vastly decreased wear rates per horsepower-hour of service. Since badly worn compression rings can cause a crankcase explosion this hazard is greatly reduced.

Compressors were originally pneumatically-controlled on an individual basis but this was not satisfactory for multiple unit locomotives and electric controls were devised and improved to present day satisfactory service. Thus overheating of air compressors is considerably reduced.

Compressors, originally air cooled and located in cramped quarters, had entirely too high a discharge temperature which led to carry-over of water and oxidized oil to the brake equipment. Better lubricating oils of turbine quality helped as did pressure instead of splash lubrication. But larger intercoolers (some fan-cooled) and aftercoolers, automatic main reservoir drains and best of all—water-cooled cylinder heads and liners—really improved the quality of air to the brake equipment and extended compressor life.

Originally, sander control was pneumatically relayed from one unit to the next. Now it is relayed much more simply and reliably by electricity. Sander valves or "traps" are much improved to insure a prompt even delivery to the rail at the call of the engineer or from the automatic electric sander control switch. Elimination of severe wheel slipping reduces slack action and danger of break-in-twos.

About 1957 a device was developed which detected excess crankcase pressure. Excessive blow-by of exhaust

gases from above the pistons into the crankcase could cause an explosion. This device senses such a condition and shuts the engine down. A few years later a low cooling water level device was incorporated into this crankcase pressure detector. Within the past two years a new type of device has been devised which senses rapid surges in high voltage circuits and acts to subdue the peaks before they trip the ground relay. This device is called a fault relay. Sensing devices such as these constantly monitor important aspects of locomotive operation far better than a constant patrol by the most conscientious engineman could ever hope to do.

Diesel Air Brakes.

The changes in air brakes in the past 35 years have been revolutionary! Needless to say the stopping of a train is of prime importance from the standpoint of safety. Therefore the air brake companies and the railroads have worked closely to develop and service test improvements which would insure smoother train handling and better control of the modern locomotives and trains.

For your information the model or kit of air brake equipment applied to a locomotive unit (which includes automatic and independent brake valves, control or distributing valves, relay valves, feed valves, check valves, etc.) is referred to by the trade as a "schedule". Each schedule has a unique array of specific component parts which when piped together can be used to control the application and release of brakes on locomotive units and/or cars assembled into a train.. The operating principles and sequence of these various schedules are far too complex to set forth at this time. However, I shall briefly trace the improvements and advantages made on air brake schedules for use on diesel locomotives.

Please refer to Ex. page 29 which outlines nineteen features in use on eight different schedules currently in

use on diesel locomotives. Starting back in 1926 the early yard diesels were equipped with 14EL schedule the same as the electric locomotives. This 14EL equipment was very similar to the 6ET equipment applied to steam power of the 1910-1925 era. However there were improvements in ring and gasket design which made this equipment more reliable and smoother functioning. Very little of this equipment exists today.

During the 1940's the 6SL and 6DS schedules were designed and applied to yard switchers. They were also very acceptable for single unit local or freight service. This equipment included refinements within the component parts to insure greater reliability and lower maintenance by use of improved material, redesign of certain parts and application of filters to keep them clean as opposed to the earlier 14EL schedule.

All schedules furnished after 14EL except 8EL included the self-lapping independent brake valve which permits smoother control of the locomotive brakes while switching and thus reduces slack action of the cars and wheel sliding of the locomotive. By 1958 it was evident that it would be desirable to have one brake schedule suitable for all classes of service and at this time the builders offered the 26L schedule for yard and road service.

The passenger diesels were equipped with the HSC (high speed control) schedule from the mid 1930's to 1945. This brake was designed for special light weight unit trains of the streamliner type such as the CB&Q "Pioneer Zephyr", Ex. page 26-b, and the various early Missouri Pacific "Eagle" trains. In addition to all the normal pneumatic brake functions available on all air brake schedules since the 1920's, this HSC had an auxiliary electro-pneumatic system normally used with the streamliner trains. When the engineer moved the automatic brake valve handle, this movement was relayed electrically

to each locomotive unit and car in the train consist so as to apply or release pneumatic brake control valve on units and cars simultaneously. If conventional equipment was coupled into the train, the electric brake feature was cut out and conventional pneumatic braking was used. In later years in order to fully utilize all types of car equipment and with the decline of the individual streamlined trains the electric brake (which had also been adapted to the 8EL schedule in the late 1930's and the 24RL schedule in 1946) dropped out of the picture. The Missouri Pacific no longer uses HSC schedule and hasn't used electric brakes for many years.

In 1932 the 8EL version of the recently developed modern steam locomotive 8ET schedule was placed on electric locomotives and a few years later on the first EMD model FT units in freight and some passenger service. The 8ET and 8EL had identical interchangeable portions. Practically all of this schedule has been retired nationwide.

By the mid-1940's the builders furnished a modified 6SL schedule for single unit road-switchers called the 6BL. In all respects they were identical except the 6BL units could be coupled in multiple with each other. By 1950 it was found desirable to couple 6BL to 8EL, HSC, and 24RL—hence the modified version called 6BLC which required some pipe changes and extra relay valves. Few units have been equipped with 6BLC since 1954.

In 1946 the builders offered the 24RL schedule which consolidated all the best features of 8EL and HSC plus several improvements in maintenance and operating features. The 24RL schedule was basic for all freight and passenger and some road-switch power built in 1946-1958. The 24RL has the most widespread usage at this time.

By 1958 the air brake companies had come out with the 26L schedule which incorporated all of the desirable

features of 8EL and 24RL and could be applied equally well to freight, passenger and yard service. Several new maintenance and operating features were included. This schedule has an additional advantage of uniformity for all service which reduces parts inventory and insures compatibility. It has won wide acceptance based on its superiority.

In the early 1930's step-split piston rings and rubber seated check valves were introduced to reduce leakage and promote reliability. Also, self-oiler pistons, which insured smooth response to change in pressures, were introduced at this time.

In the 1940's the following items were introduced in the new style schedules: Diaphragms in place of ringed-pistons plus rubber "O" rings and spool valves to eliminate leakage and increase sensitivity.

Throughout the years the AAR Brake and Brake Equipment Committee in conjunction with the air brake manufacturers have developed improved and more severe testing of each valve, both new and after periodic cleaning, on specially designed racks to insure against manufacturing and assembly errors that would cause malfunction.

Steam power did not have any of the functions shown in Ex. page 29 except the most modern 8ET schedule which had functions 1, 5, 6, 7, 8, 9, and 11 in a limited number of applications. Each improvement was carried through to the next schedule for road or yard service as the case might have been.

Briefly the purpose and advantage of the nineteen diesel air brake features shown in Ex. page 29 are as follows:

1. **Safety Control** automatically brings the train to a stop in the event the engineer is incapacited. It is available in two basic types; (1) The foot pedal type where the release of the foot pedal for a predeter-

mined length of time would result in a brake application, and (2) the electronic type where certain manipulations must be made at predetermined intervals (20 seconds) or a brake application will result. Safety control on diesels was required for passenger service, used on a large number of freight diesels, and currently is being applied to all locomotives. The Missouri Pacific and subsidiaries use the foot pedal type on the majority of the units but we have applied the electronic type to new power and yard power since 1964.

2. **Self-lapping independent brake valve** permits increasing, maintaining or decreasing brake cylinder pressure with a single movement of the handle. This permits smoother control of the slack and lessened chance of sliding the drive wheels.

3. **Multiple-unit Control** allows full control of the braking system on all units coupled in multiple from a single control station.

4. **Overspeed Control** guards against the locomotive exceeding the maximum safe speed of the locomotive or train by invoking a safety control action.

5. **Power Knockout** reduces the flow of power to the drive wheels in the event of an emergency or safety control brake application.

6. **Penalty Suppression** is provided so that an engineer can suppress or prevent an overspeed control or safety control from applying before the time delay warning whistle expires and thus keep his locomotive under control without experiencing an undesired brake application.

7. **Synchronized Brake Application** introduced with 8EL schedule allowed train and engine brakes to apply uniformly in order to reduce slack action on long trains.

8. **Controlled Emergency** prevents slack action by adjusting the rate of driver brake build-up according to train length during an emergency brake application.

9. **Actuated Release** is a means of positive independent release of brakes on all diesel units coupled in multiple after an automatic brake application. This prevents overheating of driver brakes on all units during a period of long automatic or train brake application.

10. **Dynamic Brake Interlock** prevents a combined application of dynamic brakes and air brakes on the diesel unit during an automatic brake application so as to prevent slid flat driver wheels.

11. **First Service Application** permits a minimum 6 to 8 p. s. i. brake pipe reduction to adjust train slack and then a controlled rate of brake pipe reduction in spite of variable brake pipe leakage.

12. **Electro-pneumatic Brake** previously described under the HSC schedule was basically an electrically activated straight air brake for high speed passenger trains.

13. **Release Insuring Valve** function in the event of excessive slide valve friction in control devices to insure a full release of driver brakes and prevent overheated wheels which could cause thermal cracks and possibly a derailment.

14. **Automatic Split Reduction** functions in the event of a safety control or overspeed control application. A split reduction is made to control the train slack. This consists of a 6 p. s. i. initial reduction, a measured pause, then a full service brake application.

15. **Brake-in-Two Protection** guards against a loss of locomotive brakes in the event the units or train is accidentally parted.

16. **Emergency Sanding** automatically operates the sanders on all units in a consist for a pre-determined period to improve wheel to rail adhesion and assure maximum braking without attention from the engineer.

17. **Pressure Maintaining** allows uniform brake pipe reductions plus positive and quicker releases in spite of existing brake pipe leakage. This reduces slack action and lessens the chance of overheated wheels.

18. **Controlled Release** uses feed valve air rather than higher pressure main reservoir air for charging or recharging the brake pipe and thus prevents an overcharged brake system and stuck brakes.

19. **Self-Lapping Automatic Brake Valve** permits application of train brakes in small increments as necessary to insure proper control with lessened slack action.

In steam engine days the engine crew often had to fuss with a balky steam driven compressor or repair broken pipes. Brake valves were hard to operate due to carbon and dirt carryover into the rotary valves. Undesired emergencies due to such items were fairly common. This of course led to harsh slack action and break-in-twos. Couplers or even whole ends of cars would tear out and sometimes cause a derailment.

With diesels the mechanical driven compressor needs only a daily check of lubricating oil level. Broken pipes from vibration and sticking brake and control valves are rare events. With even torque diesel power and modern braking features outlined above the engineer can do a far better job today in controlling slack and averting break-in-twos. Hence there is no longer a need for a fireman to furnish compressed air for braking and there is considerably less work for the train crew and brakemen

in particular in regard to sticking brakes and break-in-twos. Furthermore with improved brakes, improved cars, cushion draft gear, etc., the ride is more comfortable for the trainmen in the caboose.

All of the above features of the diesel air brake system tie in with the improved AB and ABD freight car brakes; also AB1B, D22 and 26C passenger car brakes to insure safe, smooth control of today's trains.

The Diesel Engine Crew.

From the very first designs for yard and passenger operation to the present day models, the designers built the cab so that the engineer-operator had all of the equipment necessary for controlling the train and the locomotive consist within easy reach of his station. The early diesel switching units were designed and laid out by the builders to operate without a fireman. In an advertisement appearing in The Railway Age magazine January 23, 1933, American Locomotive Company commented in regard to one of their switching locomotives: "However, the operation of this type of locomotive requires only one man." This kind of thinking has been carried through every model switcher built in the United States. EMD Specification No. 589 of January 3, 1939, for 600 HP diesel switching locomotives on Page 1, Item 3, said, "Maximum visibility providing safety for one man operation." This design has been retained in all switch units since that time.

Ex. pages 30 to 43 illustrate the general arrangement of diesels presently in use in Arkansas so that one can become familiar with the location of principal parts and also with the cab arrangements and view therefrom.

Ex. page 30 shows the general arrangement of an EMD 1200 HP SW-1200 yard-switcher. It is also typical of 600 to 1200 HP models SW-1, NW-2, SW-7, SW-8 and SW-9. Ex. page 31a and b shows the engineer's and fireman's

stations, respectively. Ex. page 32-a shows the forward view from the engineer's station. Ex. page 32-b illustrates the engineer's station on Alco 1000 HP S-2 switching locomotives—also similar to 660 HP yard and 1000 HP road switchers.

Ex. page 33 is the general arrangement of an EMD 1500 HP F-7 carbody type road freight unit. It is also typical of the F-3 and F-9 series. Ex. pages 34 and 35-a show the engineer's and fireman's stations respectively. The seat in the foreground of Ex. page 35-a is generally used by the head brakeman. Ex. page 35-b shows forward view from engineer's station.

Ex. page 36 is a plan view of the general arrangement of an Alco 1500-1600 HP RS-3 road-switcher. Ex. pages 37-a and 37-b show the engineer's and fireman's stations, respectively.

Ex. page 38 shows the general arrangement for an EMD 1750 HP GP-9 road-switcher. It is very similar to the series GP-7 units with high, short hoods. Ex. page 39-a shows the engineer's station and 37-b shows fireman's and brakeman's station. Ex. page 40 shows forward view from engineers' station—(a) an EMD GP-7 with long hood operating as forward end, and (b) an Alco RS-11 and GP-16 with short hood operating as forward end.

Ex. page 41 shows the general arrangement for an EMD 2500 HP GP-35 road-switcher. It is typical of other low, short hood units such as the GP-18 to GP-40 inclusive. Ex. page 42 shows the engineer's station and forward view. The fireman's and brakeman's station is similar to Ex. page 39-b—GP-9.

Ex. page 43-a shows the engineer's station on a one-man 44-ton switcher. In Ex. page 43-b you see the same view as the engineer—a man on the ground on left side passing signals to the engineer on the right side through a mirror in the left cab window.

There are many more examples like Ex. pages 30

through 43 which show that, when the crew went from the steam locomotive to the diesel and the other non-steam locomotives, those controls and appurtenances which had to do with the fireman's operation of the steam boiler were left behind. The fireman's side of the diesel cab became a blank. These photographs illustrate the excellent vision afforded the engineer and brakeman on the diesel locomotive. Sufficient clear vision windows, low or no running boards, and no clouds of smoke or steam mark a sharp contrast with steam operation.

The only control required to be on the left side of the cab is the emergency brake valve as prescribed in I. C. C. Locomotive Inspection Act Rule 91.204b per Ex Parte 174 which was effective December 31, 1958. Common locations for this valve on car body and road-switcher type locomotives are shown in Ex. Page 44. This valve was also required on the front end of steam locomotive tenders and was for use by any crew member in event of emergency.

Not one modification has been necessary to our diesels to permit operations without firemen in the other states through which we operate except for application of "deadman" or safety control on yard switchers.

The earliest successful diesel freight units did not have all automatically controlled devices. The plan view of an early EMD 1350 HP, Model FT, as shown in Ex. Page 45, indicates the location of the manually controlled radiator shutters and fan clutches. For this design an occasional checking of the engine rooms was required during the time the locomotives were moving. The railroads and the design engineers of the builders quickly realized that haphazard surveillance of equipment and controls was not satisfactory and automatic controls were developed. With the advent of the model F3 locomotive patrolling was no longer required, and furthermore, with the adoption of the road-switcher type with the outside running board, it could prove dangerous. Hence for a long time we have

had definite instructions placed with all crews that they are not to go back through the units while the train is in motion; that if an alarm sounds while train is in motion to stop will be made, cause ascertained, and such corrective measures taken as conditions may be required. In addition, we have removed the ramps at the end of the road-switcher platforms which permitted walking directly from one unit to another, and have also placed a solid end rail across the end platforms of such motive power to further deter personnel from walking between units while the train is in motion.

The need for the fireman as an assistant in the transfer and control of fuel and the regulating and metering of energy produced or available, or in the so-called "production of power", does not now nor never did exist on diesel locomotives!

No machine has yet been devised by man that is not prone to a failure of some kind. Ex. Pages 46, 47 and 48 outline various types of failures that have occurred on diesel locomotives. Failures outlined under category "A" are of such a type that the continued operation of the unit in train service may create a hazard. Whenever such a failure is detected the only alternative is to carefully set the unit out of the consist, call for mechanical assistance to repair the unit, and proceed with the remainder of the consist and train.

Whenever a failure outlined under category "B" occurs the unit can be isolated from operating under load, and even shut down if necessary by the engineer. In these instances the unit can remain in the consist or be towed to the next maintenance point for repairs. None of the failures in this category can be repaired by the engineer with the tools and supplies available on the locomotive.

Category "C" outlines the defects or failures which may be repaired by the engine crew. In practically every instance all that is involved is the resetting of survey or pro-

tective circuits, which can be done without the use of any tools whatsoever.

Ex. Pages 49, 50 and 51 outline various types of security or protective devices in use on locomotives common to the Missouri Pacific and other railroads which operate within the State of Arkansas. For each item or device I have shown its function, symptom of its activity, type of alarm and how it is re-set. As a matter of information, each cab of Missouri Pacific locomotives has a sign shown in Ex. Page 52, reminding engineers of quick check points in the event of trouble. In addition, several classes of our power have a locomotive trouble chart, such as Ex. Page 53 for GP-18 locomotives. We have found that these check lists materially aid engine crews in locating trouble. Most troubles are very minor in nature and can be quickly pinpointed by reference to the check list and chart. In addition to this information we have made manufacturers' instruction manuals available to our enginemen. Ex. Pages 54-58 are excerpts from such a manual on our EMD GP-18 locomotives. In addition, we conduct air brake and diesel classes periodically on a specially equipped car and Road Foremen of Engines and Diesel Supervisors ride with the crews and instruct them on operation and rules compliance.

From my experience in operating and maintaining diesel locomotives, and in training engine crews since the early days of the FT locomotive in 1944, I am firmly convinced that the engineer can take care of any minor difficulty which may arise on his locomotive. If there is a major failure, as shown in Category "A", Ex. Page 46, he has no alternative but to stop and set the unit out of the consist. Setting out the unit can be done by one man in a very short period of time. I have personally performed this operation many times myself. If I could set out the middle unit of a consist in less than 30 minutes and couple the consist together again, I am sure the engineer with the assistance of a brakeman could perform this service in the same, or less time.

In the event of a failure in Category "B", Ex. Page 47, the engineer can stop the train and isolate or shut down the unit in trouble. This action would take no more than five to ten minutes at most. In an extreme emergency the engineer can always shut down all of the units in the consist by pressing home the emergency shutdown button at the control station and then take care of the emergency on the unit in trouble and restart his remaining units.

In the event of a failure in Category "C", Ex. Page 48, the engineer can stop the train, locate the troublesome unit, and reset per Column E shown on Ex. Pages 49, 50 and 51.

Ex. Page 59 shows our "Standard List of Tools and Equipment on each diesel 'A' unit, etc." Basically, the tools provided are a flat chisel, 2-lb. hammer, 14-inch monkey wrench and a chain wrench, which will permit changing of broken knuckles and brake rigging on cars and air hoses and some piping on locomotives and cars. Obviously we don't expect the engineer to make elaborate field repairs but we do expect him to reset security devices, change fuses and make what minor adjustments he can with the tools at hand.

Ex. Page 60 shows the system-wide locomotive delays and failures reported for years 1962 through to June, 1966. The effect of retiring obsolete power, purchasing modern motive power and maintaining a vigorous repair program has significantly reduced the failures through each of the years.

We cannot afford to entertain delays on line of road due to failures of locomotives. Traffic is entirely too competitive today not only with our neighboring railroads but also with truck lines, air lines and even barge lines. Our customers are paying for prompt delivery of their goods in salable or usable condition on arrival. While a delay of 5 minutes due to failure of a locomotive may not seem much, we have kept track of delays of 5 minutes or more for many years and have followed them up care-

fully to determine the exact cause, ascertain responsibility and take action to prevent such delays in the future.

Our total delays for 737 locomotive units range from 1051 in 1962, 714 in 1963, 452 in 1964, and 440 in 1965 and we expect that with further policing this failure rate will be even lower by the end of 1966. There are two avenues toward reducing such delays. One, which I have previously discussed, involves training the enginemen to recognize minor defects and take care of them promptly to the best of their ability. The other is to set up a preventive maintenance program which will detect and stop defects from becoming a major problem on the road. In addition, there are certain rules and regulations prescribed by the ICC Locomotive Inspection Act which must be complied with on a periodic basis.

Each locomotive is thoroughly inspected before each trip on the road or each day in the yard and once every 24 hours thereafter to make sure that it will be safe and suitable for service per ICC Rule 203. In addition to the daily inspection there are many other periodic ICC tests governing the cleaning, testing and inspection of specific appurtenances including a monthly inspection per Rule 365. The latter is similar to the daily except that certain information is placed on a cab card by the railroad's inspectors certifying as to the condition of the locomotive. During these inspections the locomotive must pass other ICC rules in regard to limits of wear and general condition.

Ex. Pages 61 to 70 inclusive show the items covered by trip or daily inspection, monthly, quarterly, 6-month, annual, etc., for all classes of locomotives. I think that it is apparent from looking at these work sheets that it is our sincere intention to keep our motive power in safe and reliable condition. If, in the course of performing any of the previously described inspection and maintenance work, a condition is noted which would not allow the locomotive

to safely complete its trip, the condition is corrected before dispatching the unit.

In spite of the aforementioned delays and failures attributed to our fleet of 737 diesel locomotives, these machines are really quite remarkable. A yard switcher averages 40,000 miles per year, road switchers in road and branch line service average 54,000 miles per year; road freight units average 144,000 miles per year; road switchers in high speed freight service average 193,000 miles per year; and passenger units average 201,000 miles per year.

Diesel engine power assemblies are changed out on the average of 480,000 miles. Main generators normally accumulate well over one million miles between general overhauls; traction motors average nearly 400,000 miles between overhauls. All of this in spite of exposure to extremes in weather and heavy duty operation conditions.

I can well remember in the early days when we used to renew broken piston rings nearly every trip. I can remember when we used to overhaul the diesel engine at 250,000 miles and motors at 300,000. I can remember when it was not unusual to have a stuck starting contactor or a burned power switch control interlock every trip or two.

But the locomotive manufacturers have made tremendous progress in building equipment which will now deliver more than twice as much horsepower with the same physical limitations that existed in 1945.

In line with the increased capacity and the improved performance of diesel power is the diesel's excellent safety record.

Steam was in its prime in the years 1945 to 1954. This is when the most modern locomotives and operating methods were in effect. Based upon the annual reports issued by the Director of the ICC Locomotive Inspection Bureau and the ICC OS Statements for this particular period, it is interesting to note that steam locomotives accrued 1,491,621,000 unit miles in 1945 and that this mileage had dwindled to 190,582,000 by 1954. During this

10-year period there was an average of 230 accidents per year with a peak of 419 accidents in 1946 alone. All of these accidents were attributed to failure of some part or appurtenance of the steam locomotive. Injuries range from 39 in 1954 to a maximum of 439 in 1946. Fatalities ranged from one in 1954 to a maximum of 20 in 1945. Breaking this down on the basis of casualties per 100 million unit miles, the total casualties range from 20.98 in 1954 to 38.53 in 1947 (See Ex. page 6).

It is interesting to compare steam to the safety performance of other-than-steam from 1937 (the beginning of production model diesels) to 1965 (the last available ICC fiscal report) as shown on Ex. page 71. During this 29 year period there were a total of 1,338 accidents which caused 15 deaths and 1,880 injuries—an average of only 65.3 casualties per year. This tally reflects the growth of diesel power from 1937 to the practical end of steam power in the late 1950's even though it includes a small percentage of electric locomotives in the total figures.

Traffic levels for the years 1963, 1964 and 1965 averaged 659,417,793,333 revenue ton miles per year which is closely akin to the 1942, 1943 and 1944 war year levels of 700,768,480,666 revenue ton miles per year. Yet other-than-steam accounted for only 264 casualties versus 1152 steam casualties in those respective key periods.

Previously I pointed out that the ICC fiscal reports disclosed 2307 accidents attributed to failures of steam locomotives, tenders and appurtenances in years 1945-1954. These resulted in 108 deaths and 2517 injuries. This same source for the identical period shows that other-than-steam locomotive defects (practically all diesels) resulted in 524 accidents which caused 11 deaths and 861 injuries. The six major causes were:

Defect	Accident	Killed	Injured
Fires: due to overflowing or leakage of fuel, crankcase explosions, back firing, etc.	66	—	84
Short circuits	64	—	56
Brakes and brake rigging	28	—	41
Couplers	11	—	15
Insulation	11	—	12
Generator and starting devices	9	—	9

Other-than-steam locomotives during this same period accrued 285,678,000 unit miles in 1945 up to 1,781,138,000 unit miles in 1954. During this period there were only 11 people killed and injuries ranged from a low of 40 in 1945 to a high of 263 in 1954 (which was more than double the next worst year of 129 injuries in 1951). Again basing accidents and casualties on a per 100 million unit mile basis, total casualties ranged from 5.18 in 1953 to 15.83 in 1946. No matter how you look at it, on the basis of total accidents, deaths and injuries, or putting it on a uniform reporting basis of accidents; without a doubt the diesel is far superior in safety than its predecessor, the steam locomotive. This fine record has been maintained and improved upon since 1954. For the last 10 years for which I have available records, 1956 to 1965, inclusive, there has been only one death and 806 injuries for a total average casualty rate slightly less than 83 per year which far outshadows the performance of steam in its prime years.

Diesel Power in Arkansas.

If you will please refer to photographs on Ex. Pages 75a-84c, I will trace the type of diesel power generally used by the Missouri Pacific in Arkansas throughout the years. During this period of time our numbering system was changed on several occasions and therefore I shall

refer to the types of locomotives by the wheel arrangement system which is recognized in railroad circles. A "B+B" type consists of two power trucks each containing three powered axles, etc. An "A1A+A1A" type consists of two power trucks each having two powered axles with an idler axle between them. Thus each letter refers to number of powered axles—A, B, C, D for one, two, three or four powered axles and each numeral represents the number of the idler axles. I have chosen photographs from our file and other sources which depict the type of power used by us and other roads in Arkansas.

Ex. Page 72 tabulates the various models of diesel locomotives, as of July 1, 1966, in the Missouri Pacific ownership. Out of this group of 737 units, all classes have operated within or through Arkansas except the Plymouth yard units. This list does not account for another 294 similar units owned by subsidiary lines, many of which also have operated through Arkansas.

Ex. Pages 73 and 74 tabulate the various model diesels now operated in Arkansas by the five major railroads and also show the various models which have been or are now owned by the Missouri Pacific Lines.

B + B Yard Switcher.

Ex. Page 75-a shows a 900 HP EMC model NW-4, MP 4102, built in 1938. It had a Winton 12-201-A engine and welded steel underframe. This was one of a very small group built for us in 1936-38 for branch line and yard service—all were retired by late 1961.

Ex. Page 75b shows a **600 HP EMC model SW-1**, MP 9004. It was one of a group of SC and SW-1 (cast or welded underframes) built 1937-1941. Earlier models had the Winton 8-201A engine and later models had the EMD 6-567 engine. This type was our first diesel to operate in Arkansas. They were used for switching industries and passenger trains and until late 1965 several of them saw

service on the Doniphan, Kensett and Searcy Railroad. By 1966 all of this group had been retired or remanufactured into the SW12 model.

Ex. Page 75c shows a **660 HP Alco model S1**, MP 9008, which represents a group built 1940-1947. They were equipped with a 6-538 or 539 McIntosh-Seymour engine. All were retired by 1964 but the Rock Island still uses this class in Arkansas.

Ex. Page 76a shows a **660 HP Baldwin model S6**, MP 9009, which represents a group built 1940-1942. They had the VO 660 DeLavergne engine. All were remanufactured into SW12 models by 1963.

Ex. Page 76b shows a **1000 HP Baldwin model S10**, MP 9119, which represents a group built 1939-1950. They had the VO 1000 DeLavergne engine. By 1963 all had been retired or remanufactured into the SW12 model. The Frisco still uses this model in Arkansas.

Ex. Page 76c shows a **1000 HP EMD Model NW2**. MP 9106 represents a group built 1939-1949 with the 12-567 engine. Two of these units still operate in Arkansas. Some are also used by the Rock Island, KCS and Cotton Belt.

Ex. Page 77a shows a **1000 HP Alco Model S2**. MP 9107 represents a group built 1941-1949. They had a 6-539 turbocharged McIntosh-Seymour engine. We transferred this class of power to the Gulf District in 1963 and expect to retire the remaining units this year.

Ex. Page 77-b shows a **1200 HP EMD model SW12**. It is representative of 176 units built for us 1950-1966 which were termed SW7 with 12-567A engine, SW9 with 12-567B engine, and SW12 with 12-567C engine. There are 90 units like MP 1190 equipped with multiple unit control. In addition to handling heavier yard assignments it is not uncommon to work these units to an outlying yard assignment, oftentimes in multiple with other power on the local or through freight and then work them back to the home point for periodical inspection and maintenance at a later

date. Forty such units are assigned to North Little Rock. The Cotton Belt uses similar units.

Ex. Page 77-c shows a **1200 HP Baldwin-Lima-Hamilton model S12.** MP 9233 is representative of a group built 1951-1953. They were equipped with the 606-A supercharged engine. By 1966 all had been remanufactured into SW12 models.

Other types of diesel switchers were owned by the Missouri Pacific such as Plymouth **hydraulics, 800 HP EMD model SW8,** and **44-ton** steeple cabs by Porter, Davenport, Whitcomb, and General Electric. The latter were all retired by 1965 but are notable in that they operated in other states without a fireman since the first one was delivered in 1940 as they weighed less than the 90,000 pounds on drivers covered by the Diesel Agreement of 1937. Ex. Page 78-a shows a **44-ton Davenport** unit similar to the unit operated in Arkansas by the Rock Island but with a fireman as required by Arkansas law.

A1A+A1A Passenger.

Our first passenger diesels were 2000 HP EMC model EA-3 acquired in 1939 for the Missouri River Eagle but later used extensively in Arkansas. Ex. Page 78-b shows MP 7001 which was powered by two 12-567 engines.

In 1940 we acquired one of the few **1000 HP EMC Model AA6** units ever built. This had an A-1-A power truck at the front and a six-wheeled idler truck at the rear. The rear portion of the carbody served as a baggage car. MP 7100 is shown in Ex. Page 78c. This unit was retired in 1962.

MP 7003 shown in Ex. Page 79a was a **2000 HP EMC Model EA6** originally assigned to the Colorado Eagle but later used in Arkansas. This class was built in 1941-1946 and all were retired by early 1966. They contained two 12-567 engines.

Ex. Page 79b shows a **2000 HP EMD Model EA7** (MP 7012A) control unit and **Model EB7** (MP 7012B) which has

no road control station. This class was built 1945-1948 and fourteen units still operate through Arkansas. They contain two 12-567A engines. All Model EA3, EA6, AA6 and E7 units have mechanically driven cooling fans and traction motor blowers.

Ex. Page 79c shows a **2000 HP Alco Model PA1** unit. MP 8008 is almost identical to a later 2250 HP Model PA2. These two classes were built 1949-1952 and all were retired by 1965. They had the Alco 16-244 turbo-charged engine.

Ex. Page 80a shows a **2250 HP EMD Model E8** unit. The 7019 and sister units were built in 1950 and five are in active service through Arkansas. They have two 12-567B engines and all-electric radiator fans and traction motor blowers.

Thirty-five (35) E-type passenger units (including 16 T&P ownership) now operate over our line in Arkansas. Age and obsolescence are rapidly wiping out the streamlined passenger locomotive. The builders have ceased to manufacture them. Our streamlined E units are augmented by thirty-four (34) Model GP7 road switchers equipped with steam generators for train heat. These latter units, which were remodeled in North Little Rock shops and set at 1800 HP with a 16-567BC engine, are commonly called "hot rods" in deference to their increased horsepower and tractive effort.

B + B Road Freight and Road Switch.

Based upon the performance of the EMD demonstrator No. 103 the Missouri Pacific bought a small group of **1350 HP EMC Model FT** (A&B units) in 1943-45. Ex. Page 80b shows a four unit 5400 HP consist led by MP 502A. They were powered by the 16-567A engine and had hand operated radiator shutters and cooling fan clutches. Other roads through Arkansas also bought FT units which were identical except they had dynamic brakes. The FT models required some engineroom patrolling to operate shutter

and clutches and to insure that the dynamic brake blowers were operative. The Missouri Pacific never did purchase the optional dynamic brake as it was felt our grades did not warrant the added cost. The Great Northern uses dynamic brakes extensively account the Rocky and Cascade Mountains and other long continuous gradients. All of Missouri Pacific FT units were remanufactured into 1800 HP Model GP18's in 1960.

Ex. Page 80c shows one of a rather large group of **1500 HP EMD Model F3** units purchased 1947-1948. These units were our first to be built with a completely automatic cooling system. However they still had manual transition like the FT. They were powered by the new 16-567B engine. Occasionally some of the 28 remaining units come up from Texas through McGehee—the others have been remanufactured into GP18 units.

Ex. Page 81a shows our first serious consideration of a road switcher type since 1937-1941. It was a **1500 HP EMD Model BL2** built in 1948. The odd configuration of MP 4109 definitely shows the cross-breeding of an "F" type road freight unit at the front with a touch of an "SW" type yard switcher at the rear. These eight units had the same features and power plant as the F3's and were remanufactured into GP18's in 1962.

Ex. Page 81b shows a **1500 HP Alco Model FA1** unit MP 311. We purchased a large group of these units and the next version—a 1600 HP Model FA2—in 1948-1952. They were powered by the Alco turbocharged 12-244 engine and were comparable in features to the EMD Model F3. All were retired by late 1962 including 100 units which were remanufactured into GP18's utilizing the power trucks and other components.

Ex. Page 81c shows a **1500 HP Alco Model RS2** road-switcher unit. Missouri-Illinois 61 is similar to Missouri Pacific 1600 HP Model RS3 units built 1951-1955. They had the same features as the F1 and F2 road freight models except they used the road switcher configuration. The

short hood housed the toilet and (on some roads) optional steam generator equipment. Only fourteen (14) units of this class remain in our ownership and seven (7) have been repowered at 1200 HP with EMD Model 12-567BC engines and a D16 alternator. This conversion from RS3 to our GP12 model takes place at our North Little Rock shop. These units are used in pairs to handle the hump yard at North Little Rock and in single or multiple elsewhere in local freight service. The Rock Island had 1500 HP EMD 16-567B engine applied to some of their Alco model RS 3 units.

Ex. Page 82a shows MP 206, a **1500 Baldwin Model RF-15.** This small class was built in 1948 with 608SC supercharged engine. These units were remanufactured into Alco 1800 HP Model RS11's in 1959. The Baldwin RF15's were comparable in features to the EMD F3's.

Ex. Page 82b illustrates a **1600 HP Baldwin Model AS 16** Road switcher. These six units plus an earlier group of six **1500 HP Model AS15's** were built in 1949-1954. They had the same features as the Baldwin RF15 units except for the road-switcher configuration. All were sold by late 1965.

Ex. Page 82-c shows a **1500 HP EMD Model F7.** Unit MP 604 represents a large group built 1949-1951. The F7's incorporated many refinements for reliability and longer life components over the previous F3 and BL2 models. They also were equipped with fully automatic transition. While none of the 208 F7's still in service are assigned to North Little Rock they are often in evidence as they pass through Arkansas in freight service. F7's like the F3 and FT ahead of them, are now becoming candidates for remanufacture into modern road-switchers.

Ex. Page 83-a shows a **1500 HP EMD Model GP7**—the road-switcher equivalent of the F7. Unit MP 4275 represents a group of 208 units built 1950-1954. Of these, 34 steam generator equipped units were upgraded for com-

bination freight-passenger-yard service at our North Little Rock shops.

Ex. Page 83-b shows a **1750 HP EMD Model GP9** road-switcher. MP 4351 is representative of the forty (40) units in this class. The GP9 had more capacity and smoother control systems than its forerunner, the GP7. It was equipped with the 16-567C engine when built in 1955.

Ex. Page 83-c shows an **1800 HP Alco Model RS11** road-switcher. MP 948 is one of twelve (12) remanufactured in 1959 from Baldwin RF-15 road-freight units. The RS11's have an Alco 12-251B engine. Nine of these units have been repowered to 1650 HP with an EMD 16-567BC engine and D14 alternator at our North Little Rock shops and the remaining three will also soon be converted into our model GP16's. They are equivalent to EMD model GP9's.

Ex. Page 84-a shows an **1800 HP EMD Model GP18** road-switcher. MP 495 represents the 146 units in this class built 1960-1963. One hundred were remanufactured from Alco F1, F2 units utilizing primarily their power trucks; forty-six were remanufactured from EMD F3, F7, and BL2 units utilizing power trucks and key engine parts. The GP18's were equipped with the 16-567D1 engine; however, whenever they are due for major overhaul we are modifying them to the 1900 HP 16-645E1 engine. One hundred units are assigned to North Little Rock.

Ex. Page 84b shows a **2500 HP EMD Model GP35** road-switcher built 1964-1965. These 25 units were our first venture with the EMD 16-567D3 turbocharged engine. These 600 class units carry the stylized "Eagle" on each side. They operate in through freight service from St. Louis to Texas via Arkansas.

Ex. Page 84c shows a **2500 HP General Electric Model U25b** road-switcher built in 1966 for the Frisco. Also used by other roads in Arkansas but not illustrated are EMD 1750 HP F9, 2000 HP GP20, 2250 HP GP30 and 3000 HP

GP40; Fairbanks-Morse 1500 HP RS and 2000 HP F, both repowered by EMD; and Alco 1500 HP RSD5 and 2400 HP RSD15.

All of the above described units used in Arkansas were designed and built so that all controls necessary to operate the locomotive consist and control the train were located within easy reach of the engineer in the control compartment. A fireman is not required to assist in generating power on a diesel. This function is controlled and monitored by automatic systems inherent in the design of the diesel locomotive.

Conclusion.

When Act 116 of 1907 and Act 67 of 1913 were enacted into Arkansas Law as they concern the consist of road and yard crews, respectively, the only form of motive power in use within the state at that time for such service was steam driven. Mechanical stokers were in the experimental stage and very few coal burners had been converted to oil.

There is no argument that at that time a fireman or helper was necessary to convert fuel into power, to periodically take coal and water and clean the fire, and to regulate the water level and steam pressure.

Due to its inherent unbalanced condition the steam engine was subject to severe vibration stresses which caused excessive wear and tear upon the locomotive and track structure. The boiler was subject to extreme thermal shocks and stresses. Breakdowns requiring two men or more to effect repairs on line of road were not uncommon. The fireman often assisted the engineer in making repairs such as removing broken machinery parts, transferring weight from an overheated driving bearing, repairing a broken pipe, etc.

With the operating cab sandwiched between the boiler and the tender, with a high mounted running board,

smoke and steam obscuring the view, and only a small window for forward view the engineer necessarily required a fireman or brakeman to watch the track and train and pass signals from the left side.

The air brake systems and car construction of the early 1900's was also rather crude. Break-in-two's and derailments from mechanical failures plus lack of sophisticated signals and communications required several train men and even the engine crew at times to effect repairs or clear the line.

However, through the years the tremendous improvement in railroad equipment in general and motive power in particular is almost beyond comprehension to the uninitiated. Taking a cue from experience gained with rail motor cars, the early diesel locomotive builders designed their units for one-man operation and throughout the past 32 years since the "Pioneer Zephyr" first raced to fame from Denver to the Chicago World's Fair the builders have continued to refine and improve the diesel locomotive. The only deviation they made was to settle for manual shutters and fan clutches on model FT units based on the requirement for a fireman under the Diesel Agreement of 1937 and this design was rectified within five years.

The need for a fireman or helper to assist in the transfer of fuel and the regulating of energy produced does not now nor never did exist on diesel locomotives. These functions are performed automatically and are under the full control of the engineer.

Due to its inherent design and construction the diesel locomotive is free from severe vibrations. It is easy upon itself and track. Breakdowns, when they occur, are usually quickly corrected by resetting one of the safety control or monitor devices. Even when it is necessary to isolate a unit the remaining units in the consist can usually advance the train to its destination with very little delay. Breakdowns involving a total halt to the move-

ment are rare indeed and beyond the ability of an engine and train crew to correct. The lesser troubles can be quickly corrected or bypassed by an engineer. A fireman is not necessary to troubleshoot and make minor repairs—he cannot make major repairs.

With the cab on a diesel generally at or near one end, with large clear vision windows all around, with wide, low running boards and no smoke or steam leaks, the engineer can see the track and signals ahead and, on his side, the train to the rear. The head brakeman can watch the train on either side and the track ahead from his station in the cab when riding with the engineer between stops. He can arrange to pass signals to the cab on the engineer's side when performing station switching and passing over grade crossings. A fireman is not necessary to pass signals on a diesel nor to observe the track ahead and train behind. Nor is he necessary to be present in case the engineer should be incapacitated—the safety control device and/or the head brakeman are more than sufficient to insure a safe stop. The outstanding safety record of diesel operation is a matter of public record (See Ex. pages 6 and 71).

Modern air brakes on diesels and cars plus the tremendous improvement in car construction (as outlined in other testimony), has resulted in fewer delays on the road due to mechanical failures and break-in-twos.

Yes, there might have been a need for three trainmen or three switchmen under certain operating conditions in 1907-1913 and there is no doubt that a fireman was a strict necessity in 1907. However, the need for these crew members has long been superfluous.

From my wide experience railroading in many states, it has long been my considered judgment that a fireman is not required in freight or yard service and further that a third brakeman or switchman is not required in freight or yard service either. For example: We switch a train

with a **four** man crew—engineer, foreman, and **two** switchmen outside of Arkansas. Yet on arrival in North Little Rock under conditions outlined in Act 67 of 1913 we must use a **six** man crew—engineer, **fireman**, foreman, and **three** switchmen. To move this train to Arkansas we use a **four** man crew—engineer, conductor and two brakemen. By merely crossing the state line with the motive power and train intact, Act 116 of 1907 automatically requires a **six** man crew—engineer, **fireman**, conductor and **three** brakemen. I have been unable to detect any increase in safety or train performance by use of the extra crew members required in Arkansas, nor did I ever see any such benefits from similar laws in North Dakota and Mississippi—laws which became recognized in those states as unjust and were repealed.

Truly, our experiences in the other eleven states outside of Arkansas since the provisions of Arbitration Award 282, as implemented by special board awards on our property, were placed in effect in May 1964, have verified that these extra men are not required for any rational reason. To continue their use is only to place an excessive economic burden upon the railroads covered by Act 116 of 1907 and Act 67 of 1913.

Based upon my own personal observations plus rather detailed conversations at various times with my counterparts and other mechanical supervisors on the Rock Island, Frisco, Kansas City Southern-Louisiana & Arkansas, and the Cotton Belt Railroads during the past five years, I have become familiar with their operations and motive power and it is my sincere belief that the conclusions outlined above are equally applicable to these other roads.

INTERVENORS' REBUTTAL EXHIBIT NO. 22—

Cross-Examination,

By Mr. Ross:

Q. State your name and address, please, sir? A. John G. German, 668 Applewood Drive, Kirkwood, Missouri.

Q. Mr. German, when did the Missouri Pacific institute the rule that the head brakeman must ride the head unit of a consist on locomotives between stations? A. Well, about three years ago, as I recall, they placed instructions reinstituting the practice of the head brakeman riding the lead unit.

Q. Prior to that time it was not required that the head brakeman ride the lead unit, was it? A. I don't have knowledge of that. That is an operating matter.

Q. When did the Missouri Pacific institute or issue the rule that enginemen are not to travel between units of the GP type while the train is in motion? A. As I recall, that was before I came to the Missouri Pacific Railroad which would be prior to September 1, 1961.

Q. When did the Missouri Pacific remove the running boards provided by the manufacturer from the ends of the GP type units? A. They didn't remove the running boards, sir. They removed the walkways at the ends of the units over the couplers, removed the chains at this location and put up a solid end hand rail and that was initiated prior to my coming to this property.

Q. The catwalks were what I was referring to. I used the wrong terminology? A. Yeah.

Q. What percentage of time in your estimation would the fireman spend firing the oil fired steam engine? A. On the oil fired steam engine, a fireman would set the oil throttle, the air damper, related valves for whatever conditions they were operating under. If it was a steady heat condition, that is, a steady speed condition of constant load or just standing still, these controls could be set and not be adjusted very frequently but if it was a changing condition, then he would have to follow the operation of the locomotive. In other words, when the engineer shut off, he would shut down. When the engineer widened, he would widen and all the time he was on the locomotive, it's his job to so adjust the controls.

Q. What percentage of the fireman's time in your estimation would a fireman be available to perform the lookout function on oil fired steam engines? A. Oh, I'd say between ninety and ninety-five percent of the time. You see, when he was down on the deck sanding the engine out, he wouldn't be available.

Q. But at other times he would be? A. Yes.

Q. What about the stoker fired steam engine? What percentage of the time would the fireman be available to perform the lookout function while operating as a fireman on a stoker fired steam engine? A. Roughly about eighty-five percent to seventy-five percent.

Q. Mr. German, how do the length of runs in freight service operated by one engine crew today compare to the length of runs operated by one crew in, say, 1929? A. Most generally, just about the same. The enginemen did not make runs through terminal agreements so consequently they are still running over the same districts that they ran in former years.

Q. Any time a steam power locomotive unit was operated, it had an engine crew of two but it was operated in—but whether it was operated in multi-engine operation or single engine? A. Yes, each steam locomotive had an engineer and a fireman.

Q. If there were two steam locomotives coupled together pulling one train, then it would have an engine crew of four men, two on each engine? A. Yes, sir.

Q. What is the most diesel locomotive unit you have ever seen operating pulling one train? A. Ten units.

Q. And it is not unusual to see diesel powered trains with a multi-unit consist of four, five, six units, is it? A. No, that's normal.

Q. And the multi-unit consists are operated by an engine crew of engineer and fireman in Arkansas anyway? A. In Arkansas, yes.

Q. Mr. German, on pages 7 and 8 of Plaintiffs' Exhibit

23 which contains your exhibit to your testimony, you set out the steam ownership of Missouri Pacific at various periods. Do you set out anywhere in your statement or exhibits the number of these steam locomotives which were oil fired steam locomotives and the number which were stoker fired steam locomotives? A. No, sir.

Q. On page 10, picture A, is that you looking out ahead and firing the engine? A. Yes, sir.

* * * * *

Q. And this is an oil fired steam locomotive that you are operating? A. Yes, sir.

Q. Now, the exhibit on page 29 operating features of diesel locomotive, brake schedules. Mr. German, the inside diameter of the brake pipe is one and one fourth inches, is that right? A. The pipe is nominal one and a quarter inch diameter heavy duty pipe. Offhand I don't recall the exact inside diameter.

Q. The pipe itself is one and a quarter inch? A. Yes.

Q. This is the outside diameter? A. Yes.

Q. And this is uniform throughout the system, is it not? A. Oh, yes.

Q. So any of these schedules which you refer to here would still be operating with one and a quarter inch line pipe? A. Train type.

Q. Train type? A. Yes.

Q. Isn't this pipe usually inadequate to supply the rear of the train with the desired eighty pounds of air pressure on trains of one hundred and fifty cars or more? A. Would you repeat that please?

Q. Isn't this pipe usually inadequate to supply the rear of the train with the desired eighty pounds of air pressure on trains of one hundred and fifty cars or more? A. No.

Q. Is the air pressure on the rear of the train the same as the air pressure on the head end? A. There can be a slight taper in pressure between the head end and the

rear end but the amount of air pressure carried is spelled out in the 1958 power brake law.

Q. But there is usually a tapering between the head end, the pressure on the head end and the rear end of the train? A. There is sometimes a tapering depending on weather conditions and leakage.

Q. It is almost impossible to keep some leakage from occurring on train line pipe? A. That's true but that is also recognized by the power brake law. There is a limit on leakage.

Q. Isn't the lack of adequate air pressure the cause of sticking brakes on the rear portion of the cars on trains over one hundred and fifty cars in length? A. Not necessarily, no.

Q. This is not one of the problems that the railroads have to contend with? A. Sticking brakes can be caused by several different things.

Q. One of them is lack of adequate air pressure? A. Well, they wouldn't be sticking just from lack of air pressure. They had to have initially a certain amount of pressure to actuate. It takes a like amount to release them. What you are referring to might be termed an overcharged condition.

Q. You mean excessive air pressure? A. Well——

Q. What do you mean by "overcharge"? A. As a system is originally charged to eighty pounds per square inch and a brake pipe reduction is made to, say, sixty-five pounds per square inch and when the brakes are released, if for any reason the pressure does not again get to eighty pounds, say, on a seventy-six pounds, the brakes will not fully release and that is what is called an overcharge condition.

Q. So in that instance it would be a lack of adequate air pressure to release the brakes? A. Yeah, not enough air getting back to fully release the brakes which is not necessarily related to the size of the brake pipe or the length of the train.

Q. The brake pipe has nothing to do with the amount of pressure which the compressor is able to pump to the rear of the train? A. It limits the volume of air that can flow back.

Q. Well, this would have to do with the amount of air pressure then on the rear of the train, would it not? A. Your question was or your statement was—would you repeat the statement again?

Q. The lack of volume of air that the compressor is able to pump into the pipe and consequently to the rear portion or rear cars of the train would determine the amount of pressure per square inch in the train line pipe at the rear of the train, would it not? A. Well, if you exceed the capacity of the pipe, yes, but we handle trains in excess of one hundred and fifty cars and it just takes longer to charge them to the required pressure assuming there is no abnormal leakage anywhere.

Q. In a train of from one hundred and fifty to two hundred cars, if there is any appreciable amount of leakage, it is very difficult to obtain the required brake pressure on the rear of the train, is it not? A. Yes, if there is appreciable leakage, absolutely.

Q. And there would be appreciable leakage on a train of, say, two hundred cars? A. Not necessarily. A bad leak on a short train can give you the same effect.

Q. What would be what you consider the normal leakage on a train of two hundred cars? A. Not to exceed three to five pounds per minute.

Q. In trains of length of two hundred cars, without any abnormal leakage, you would be able to obtain eighty pounds of air pressure per square inch on the caboose of that train, is that right? A. We might have a five or six pound taper but the taper is not a direct measure of leakage.

Q. But it is a measure of the failure to attain the proper air pressure on the rear of the train, is it not?

A. Well, it is an indication of pipe friction and leakage, yes.

Q. Mr. German, on page 32 of plaintiffs' exhibit 23 which contains the exhibits to your testimony, picture B is of an Alco thousand horsepower switching locomotive. Is this referred to as a ten hundred class locomotive? A. On what railroad, sir?

Q. On the Missouri Pacific? A. Yes. The thousand horsepower Alco switching locomotives were numbered in the ten hundred series. However, they have all been retired and sold.

Q. Mr. German, are the Alco ten hundred class engines on the Missouri Pacific Railroad the engines that have been reworked by the Missouri Pacific and a different brand engine installed? A. No, sir.

Q. The Missouri Pacific no longer has any of these Alco one thousand horsepower switching locomotives that you show as picture B on page 32? A. No, we sold the last one last week.

Q. Has it been operated in Arkansas recently or do you know? A. Not for the past three years.

Q. Does Missouri Pacific have any engines that require the services of two people to start? A. No, sir.

Q. Are there any times on any of the engines when the lay shaft must be held in or manipulated while another man presses the starter button in the cab of the locomotive? A. Once in a great while they have a stuck injector rack.

Q. And where do you form your opinion that this happens once in a great while? I say "where" on what basis? A. From my many years of experience of working around locomotives and from discussions with my staff and operating officers and from operating some of these units myself.

Q. How long has it been since you have regularly operated some of these units? A. Oh, I guess it's been about eight or nine months. I wouldn't say I had regu-

larly operated them then but I have operated them. I have started and examined operational diesels many times in the past year. As a matter of fact I was riding locomotives just a week ago, just about ten days ago.

Q. And how long has it been since you regularly operated locomotives as a part of your job or as your principal job? A. Five years then.

* * * *

By Mr. Lessenberry: Q. Mr. German, I suspect there are any number of things that determine the stopping distance of a railroad train, grade, weight, speed and things of this nature. Does weather also affect it? A. Somewhat, yes.

Q. Does the presence of, say, moisture either on the braking shoe or ice on the rail affect the braking distance, the stopping distance, excuse me? A. Moisture on the wheel or shoe is quickly removed but wet rail condition could make a somewhat longer stopping distance.

Q. From the photograph in the exhibits made a part of your testimony here, it depends on the particular type of locomotive as to the placement of the cab arrangement, the windows that are available? Is that correct? A. There are different styles of locomotives and the placement of windows is somewhat inherent in that style of locomotive but the style of, say, a road freight unit manufactured by Electro-Motive, Alco or Fairbanks-Morse is basically very similar.

Q. Also the direction that these locomotives either pull or if they are pushing determines the ability of the engineer or the fireman to see either forward or backwards? A. Yes, with the exception of the steeple cab locomotive which is centered in the middle.

* * * *

Redirect Examination,

By Mr. Light:

Q. Mr. German, directing your attention to the one and one quarter inch brake pipe used in the train line that you and Mr. Ross discussed, would any advantage be achieved by adopting a larger diameter pipe? A. I doubt it very much.

Q. Is this pipe with reference to its size standardized on American Railways? A. Yes, sir, on all freight cars and locomotives.

Q. With respect to the Alco one thousand series locomotives that you have indicated Missouri Pacific has now phased out of service, do you happen to know whether any of the other plaintiffs or railroads in this lawsuit operate any of those locomotives? A. May I refer to my——

Q. You may refer to your original testimony? A. My Exhibit at Page 73, "Diesel operation by major railroads in Arkansas", Item A, shows that the Missouri Pacific at the time the exhibit was made owned six hundred and sixty-one thousand horsepower Alco yard switchers and that at that time the exhibit was made the Rock Island operated a six hundred and sixty horsepower Alco in Arkansas and this frame and cab are identical to the one thousand horsepower.

Q. During the time you were a traveling engineer for Great Northern Railway Company, did you have opportunity to ride in the cab of steam locomotives? A. Oh, yes, many times.

Q. Were some of those hand fired steam locomotives? A. Yes, sir.

Q. Did you have an opportunity to observe the fireman discharging his duties on hand fired steam locomotives? A. I certainly did. In fact I traded off with the fireman more than once.

Q. So you have actually fired hand fired steam locomotives? A. Yes, sir.

Q. Was a fireman on a hand fired steam locomotive able to arrange his time in connection with the stoking duties so as to be available and perform the lookout function at any time the train was approaching crossings or congested areas or other places where it would be desirable to have the lookout function performed? A. Not always, no, sir.

Q. What would keep him from it? A. Trying to keep the steam pressure up and shoveling coal, operating the injector, checking his gauges and occasionally light raking of the fire.

Q. At page 4 of the exhibit filed in connection with your testimony there are pictures of the aftermath of a boiler explosion. Did you actually personally observe the things shown in those pictures, Mr. Germar?

* * * *

A. Yes, sir.

Q. That happened on the Great Northern? A. That happened at Keith, North Dakota, on January 9, 1947, just east of Devil's Lake, North Dakota. It was a part of my district.

Q. Directing your attention to the one man motor car, motor cars that were used on various railroads and pertaining to which you give some testimony and have reproduced some pictures, can you state from your experience and knowledge whether those cars in their operation ever sustained mechanical malfunctions? A. Yes, sir, they did.

Q. What size crew was used on those cars? A. An engineer, a conductor and sometimes one or more brakemen depending on the size of the train and the nature of the work performed.

Q. When a mechanical malfunction was encountered on the road, who corrected it? A. The engineer.

Q. Did that ever require stopping the train or the motor car? A. Yes, sir.

Q. Mr. German, since you have been with the Missouri Pacific has the railroad had any program with respect to installation of automatic stopping devices on diesel locomotives and when I say "automatic stopping devices" to make sure my terminology is not misleading I'm talking about the deadman's pedal and the vapor alerters? A. Vapor is a proper name, V-A-P-O-R. Yes, sir. We extended the use of deadman pedal to yard switches and on purchases of new locomotives we applied the Vapor alerter.

Q. Would you explain that device, please sir? A. The alerter is an electronic device which is actuated by movements of the engineer. If there is no activity recognized within, say, twenty seconds, the alerter will sound a warning buzzer and then if no further action is taken, it causes a penalty to application of the air brakes and unload the unit.

Q. Is this penalty application of the air brakes similar to what results when the deadman pedal is released in the unit where it is installed? A. Yes, sir. That function is exactly the same but on a deadman pedal, you suppress an air valve with your foot. On the alerter it censors your movement or lack thereof.

Q. How many diesel units operated by the Missouri Pacific Railroad Company today have either a deadman pedal or a Vapor alerter installed? A. To my knowledge all of them.

Q. Have you had an opportunity to look over Plaintiffs' Exhibit Nos. 47 through 74 filed in this action? A. Yes, sir.

Q. Have you noted in examining that exhibit the type of motive power used by these short line railroads and industrial rail facilities and military rail facilities in Arkansas? A. Yes, sir.

Q. Are you familiar with all of these various types of locomotives that are described in that exhibit? A. Generally speaking, yes.

Mr. Ross: Mr. Light, I am going to object to this line of testimony. I don't believe this is proper redirect on the part of plaintiffs because no mention was made of these exhibits by intervenors on cross-examination nor by the defendants on cross-examination.

Mr. Light: I would have to agree with your position on that. By developing this testimony we may be able to obviate the necessity of having Mr. German attend trial and therefore save trial time and I would like to explore this briefly by agreement but if that is not possible I won't explore it any further now.

Mr. Ross: You may explore it over my objection and possibly I can withdraw the objection later, but my objection will still have to stand at this time.

Mr. Light: I will do it subject to that, be brief with it.

By Mr. Light: Q. Did you respond that you were very familiar with the various types of locomotives? A. Yes, sir.

Q. What is there, if anything, about those locomotives used by those railroads in Arkansas that would make the engine manning requirements different from the requirements on the type of locomotives used by Missouri Pacific, if there is any such thing?

Mr. Ross: I object to that question on the grounds that it is leading.

Mr. Light: All right, I will rephrase the question.

Q. Is there anything about those locomotives used by those railroads in Arkansas that differs materially from the locomotives in use by Missouri Pacific pertaining the manning requirements of the engine crew? A. In my judgment, nothing.

Mr. Light: I am going to examine Mr. German briefly on materials that were not included in the cross-examination and it is my understanding that this is subject to the continuing objection of the intervenors for the reason that it is not proper subject matter for redirect examination and it is agreed that the intervenors without waiving

that objection may at this time cross-examine this witness on the areas of his testimony to which they have objected. Is that agreed?

Mr. Ross: That is agreed.

Mr. Lessenberry: For the record, a similar agreement is made by the defendants.

By Mr. Light: Q. Mr. German, are you familiar with the malfunction that occurs on diesel locomotives known as failure to make proper transition? A. Yes, sir.

Q. What corrective measure is required to handle that situation? A. It requires adjustment of resistors by cleaning of contacts.

Q. Where are those resistors or contacts located physically within the diesel unit? A. In the high voltage cabinet.

Q. Is there any rule or policy pertaining to access to the high voltage cabinet by the engine crew? A. Yes, sir, in our safety book it is shown as a hazard on diesel locomotives.

Q. Would you state the name of the book and page where that appears? A. The book is "Our Safety Plan" effective November 1, 1950, issued by the Missouri Pacific Lines and nine other railroads and the rule I refer to is in Section "Diesel Engine Hazards".

Q. By what language is this hazard characterized in the book? A. Actually by several rules. Rule 4 "Putting face or hands near main generator or any high voltage equipment while it is working under load".

Rule 14 "Repairing switches, contactors or other high voltage equipment without opening control switch and main battery switch",

Q. In connection with the one you just read, can the malfunction involving failure to make proper transition be corrected when the control switch and main battery switch is open? A. No, it cannot be properly corrected.

Q. Now, is there another rule in this same field? A.

Rule 20 "Using feet or improvised objects to close or open contacts while under electrical load".

Rule 21 "Opening high voltage cabinet when motor is running other than idling".

Q. Is it possible to correct the malfunction involving failure to make proper transition while the motor is idling? A. Not without instruments.

Q. Would those instruments be available on the locomotives to an engine crew on the road? A. No, sir.

Q. Mr. German, when this malfunction, failure to make transition, occurs on the road, what should the engine crew do about it? A. If it merely involves a unit that stays in series, in other words low gear, nothing. It will pull on the hills when required.

Q. When a diesel unit is failing to make proper transition, what does it do in the way of contributing to the motive power of the train while it is in that condition? A. The example I just gave, the unit will load fully in the low speed range but it will load lightly in the high seped range.

Q. Would you describe that in terms of a train running along level ground and then a train running on an upgrade? A. When a unit starts out on a level or is going uphill in speed, say, under twenty-eight miles per hour, it is in what we call series or series shunt connection and it will fully load. Now, if it fails to make transition as the train accelerates over twenty-eight miles an hour, it will do one of two things. It will stay in series shunt and just load very lightly, about two hundred amperes when the other units may be working four hundred or five hundred. Now, if it tries to make transition and can't complete it, the engine crew would get a wheel slip alarm as this unit tries to make parallel connection, fails to do so and drops back to series. In this case, if the unit will not make the parallel connection, it might just as well be isolated.

Q. How would you characterize the view available to

the engineman on the diesel locomotives now in use on the Missouri Pacific Railroad, how does that compare with the view that was available on the steam locomotives that were previously in use? A. The view from any diesel locomotive is far superior to the steam engine.

Q. Is there any trend in connection with purchasing new locomotive equipment by this railroad company with respect to the type of view that is afforded the engine crew? A. Yes, sir.

Q. Describe that, please? A. Since 1962, our road switcher units have been purchased with the so-called low hood with windows clear across the front of the cab.

Q. How many such units are now in service on this railroad? A. One hundred and seventy-five.

Q. How would the view from those units available to the engine crew compare with the view that a driver of an ordinary passenger automobile has? A. He would have the same broad view.

Q. Have you had occasion, Mr. German, during strikes to operate locomotives? A. Yes, sir.

Q. Did you do so during the strike that occurred during late March of 1966? A. Yes, sir.

Q. What operations did you conduct then? A. I took the train out of St. Louis, Missouri to Riverside, Missouri, switched all of the industries and interchanged to the Missouri-Illinois Railroad and brought a train back to St. Louis.

Q. What size crew did you have for this operation? A. We had myself as engineer, a conductor and two brakemen.

Q. Who was the conductor with reference to what his normal job was? A. Mr. McKeithen, assistant engineer of track.

Q. And who were the two brakemen with regard to their usual and customary duties? A. Joe Savage who was in the contract division or the operating vice president and Mr. Marlar who is material supervisor at St. Louis.

Q. Did you experience any crossing accidents during this operation? A. No, sir.

Q. Did you experience any injuries to members of the train crew during this operation? A. No, sir.

Q. At Page 58 of your testimony you refer to inspections of diesel locomotives before each trip or each day in the yard. Who performs that inspection service? A. Most generally shop craft employees. They perform the daily inspection required by Rule 203.

Q. Are these mechanics? A. Yes, sir.

Q. Mr. German, have you had an opportunity to examine the testimony of Mr. Glenn F. Brilley and the photographic exhibits attached thereto? A. Yes, sir.

Q. Are you familiar with the type of locomotive of which those photographs were taken? A. Yes, sir. This is formerly an Alco model R. S. 3, fifteen hundred horsepower road switcher which we repowered in our shops at Little Rock with an electro-motive twelve hundred horsepower prime mover and renumbered into the ten hundred series that was in question a while ago.

Q. Do the pictures there which purport to show the view from the cab of the engine do so fairly? A. No, I don't believe so.

Q. Would you state which picture you have reference to and tell what distortion, if any, there is? A. Well, Exhibit C shows the window in front of the engineer's control and at the top of this window the sun visor which is adjustable to many positions is pulled down to block out I would say the top twenty percent of the window. The window curves slightly up like this (indicating on photograph).

Q. Are the other photographs purporting to show the view from the engine cab? A. Yes, sir. And normally the windshield wiper which is shown in Exhibit D—it is this blade here—and Exhibit F., is down out of the way. There is a lever on the inside of the cab that you can use to restore this to the far over position if you should happen to

halt it in mid position. It is an air operated windshield wiper.

Q. Is the photograph taken in Exhibit A with the camera, taken with the camera positioned as the engineer would be sitting as he looked out of the window in his cab? A. No, in my opinion, it is aimed just a little bit low.

Q. When you were with Great Northern, was there a practice of interchanging with certain Canadian railroads? A. Yes, sir.

Q. Did you have an opportunity to observe what sort of motive power was employed by the Canadian railroads? A. Yes, sir.

Q. What sort was employed? A. Identical to what we presently have and have had in the past on the Missouri Pacific.

* * * *

Recross-Examination,

By Mr. Ross:

Q. Mr. German, on the alerted type train stop device, if the engineer has one hand on the brake, one hand on the whistle cord whistling for a crossing and the warning device sounds on the alerter system, what does the engineer do? A. He can remove his hand from the brake valve just instantaneously.

Q. He would have to remove his hand from the metal? A. Yes.

Q. How often does the engineer have to make some movement in order to keep the penalty application, in order to prevent the penalty application of the brakes on locomotives using the alerter system? A. He has to make or break a contact approximately every twenty seconds.

Q. If the engineer has one hand on the brakes and is leaning out the window for some purpose and the warning device sounds, what action would the engineer have to take? A. Well, most of the brake handles are so insulated

so they are not involved in this particular feature and he merely has to make or break contact with the metal as the case may be to restore the cycle.

Q. If he were leaning out the window, he normally would be in connection with some metal, would he not? A. Not necessarily. The window ledges have pads on them.

* * * *

Q. Is your testimony concerning the failure to make proper transition and the proper corrective measure therefor uniform on all locomotives, all diesel electric locomotives? A. Yes.

Q. I believe you referred to some cabinets enclosing high powered electrical wiring and such devices? A. Yes.

Q. Are these enclosed on all locomotives? A. Yes, sir.

Q. Are these—— A. And each cabinet has a sign on it saying "Danger, Six Hundred Volts".

Q. And there is no remedial action which the engine crew can take when an engine fails to make proper transition? A. No, sir. We don't want them in the high voltage cabinet when it is under load. We don't want them messing with the equipment.

Q. What about when it is not under load, Mr. German? A. The engine crew has neither the know-how nor the tools to take remedial action on problems of transition control.

Q. Do these rules you referred to prohibit the engineman from taking remedial action when the engine is not under load? A. Are you speaking of transition trouble, sir?

Q. Yes? A. They are not equipped to repair transition troubles, whether it is under load or not under load.

Q. My question was whether or not they are prohibited by these rules you mentioned from doing so? A. They are not prohibited from entering the high voltage cabinet if the unit is isolated, in other words, taken off from under

the load and secured as outlined in the rule that I read earlier.

Q. Are the engines which you referred to as having a clear view—I believe you said the Missouri Pacific had some one hundred and seventy-five of these units—are these the GP-18, GP-35 type? A. Yes, sir, GP-18, 28, 38, 35 class and the new ones that we will receive next month, the SD-40 class.

Q. Are these all manufactured by Electro-Motive Division of General Motors? A. Yes, sir.

Q. Is the same view provided on the newer type General Electric locomotive? A. Yes, sir, both Alco and General Electric offer the same style of cab.

Q. In Plaintiffs' Exhibit 23, page 42, there is a view of the inside of either a GP-18 or a GP-35 road switcher. Is this the clear view to which you refer? A. Yes, sir. I referred to it as a broad view.

Q. But this is the view which you have referred to as being a clear view on these one hundred and seventy-five units or this is a good view? A. This is a broad view cab that I described on our one hundred and seventy-five units.

Q. Is this picture taken from the eye level of a man seated at the engineer's seat on this locomotive? A. It's taken with the seat as far back as it can move. That is about the position that you would get, as far back as you can move the eye level.

Q. Is this taken by someone seated in the engineer's seat? A. Well, let me say this: You can't sit in a seat and get a picture that is the same as where the camera is —I don't know how to explain it but a camera here is not the same as your eye here. You have to have the camera back here. Do you follow me? In other words, the camera is where the man's head would be.

Q. Then, this view was taken with the lenses of the camera in the position normally occupied by the eyes of the engineer? A. Yes, sir.

Q. While he is seated in the engineer's seat? A. Yes, sir.

Q. In this type of locomotive? A. Yes, sir.

Q. With the engineer's seat pushed as far to the rear of the locomotive compartment, cab as possible? A. Yes, it is an adjustable seat. It has fore and aft motion to it.

Q. Did you take this picture, Mr. German? A. No, sir, I didn't take this picture.

Q. Were you present when it was taken? A. This picture was taken on the test track at LaGrange, Illinois and I don't recall if I was here when this picture was taken or not. We took several pictures.

Q. Then, you have no personal knowledge as to where the camera was located at the time this picture was taken? A. On this picture, no. I have a picture in my own files that I took myself in the same area with the same view.

Q. Mr. German, I am not clear on this ten hundred series locomotive that we talked about earlier. Is there a locomotive which has been converted into the ten hundred series locomotive which the Missouri Pacific still operates? A. Yes, sir, there are several models in the ten hundred series.

Q. What is the difference in this ten hundred series that we are talking about now and the ten hundred series which you said had been retired, the last one I believe last week? A. The ten hundred series Alco S-2 model locomotive which was a one thousand horsepower yard switcher is the one whose cab controls are shown in my exhibit page 32-B. Then we have a group of Electro-Motive thousand horsepower yard switchers which has a cab typical of that shown in 32-A and very similar to that shown in 31-A and B.

Then the present GP-16's which were converted from Alco RS-3's are road switcher locomotives and they have cab configuration shown in 37A and B and the cab configuration was not changed at the time we repowered the unit.

Q. Which one of these units is the unit referred to in Mr. Briley's testimony that we talked about? A. The one shown in 37 A and B, our present model RS-3 with the Alco engine in it or GP-16 with the Electro-Motive engine in it.

Q. Mr. German, in those pictures which are exhibits to Mr. Briley's testimony, you can readily ascertain from viewing those pictures that there is a sun visor on one of the windows and that those are windshield wipers on those other windows that you were talking about, can't you? A. Yeah.

Q. On the pictures on page 37, there are also windshield wipers shown on those windows, are there not? A. Yes, sir, but they are not down in the middle of the window.

Q. No representation was made in Mr. Briley's statement, was there, that this sun visor nor these windshield wipers were located in the position shown in the pictures at all times, was there? A. No, but they are not in the usual, normal position.

Q. Mr. German, the eye level at which, or the position that would be the eye level of a man sitting in the engineer's seat would depend on how tall that man was, wouldn't it or how short? A. It would depend upon the man's height and how he adjusted his seat box.

Q. I take it you are not saying that those pictures in Mr. Briley's exhibit were not taken at eye level from the engineer's seat in the cab of that locomotive? A. Well, my opinion none of them are necessarily from the eye level of the man on the seat box.

Q. Could they be? A. Well, I don't know if they have been cut off or not. If they haven't been cut off, they are not necessarily at the seat box level. I mean from the engineer's standpoint.

Q. Are you speaking in terms of the amount of the cab contained in the picture? A. Well, this picture or any of these pictures depend upon the construction of the

camera and the angle of the camera and, frankly, I can't say one way or the other whether they are or they aren't. Some of them look to me like if they were from where a man sits, he would be in a slumped position, for example Exhibit F.

* * * *

Q. Mr. German, is your quarrel with Exhibit F to Mr. Briley's testimony, the angle at which the camera may have been held? A. No, sir. The only comment I made about Exhibits D and F was the location of the windshield wiper blade.

* * * *

By Mr. Lessenberry: Q. Do you know if the photograph taken which are part of exhibits to your testimony were taken with a wide angle lens, what type of camera was used? A. No, I don't know on some of these pictures what style of camera was used and some of the pictures that our engineer of test took and that I took were with normal lens cameras, not wide angle.

Q. A wide angle lens camera will give you greater lateral view and some distortion of the matter that is portrayed in the photograph? A. It would depend upon the placement of the camera, yes.

Q. In reference to your answer to Mr. Light's question about the comparable view from the cab of a diesel locomotive and that of an automobile, you are not referring to the obligation of the engineer of the diesel as opposed to the obligations of a driver of a motor vehicle in different things that each are required to do or ought to do in a reasonably safe operation of either the motor vehicle or the diesel locomotive? A. I wasn't comparing the obligations of the engineer versus the automobile driver. I was merely pointing out the broad range of vision available on the low head unit as being comparable to say a passenger automobile.

Q. Now, the deadman operation as I understand it

works on a simple principle of pressure and apparently some criticism of a deadman pedal is that that pressure might be inadvertently applied in a manner which does not indicate that the engineer is possessed of his faculties or is conscious?

* * * *

Q. Is that correct? A. Deadman pedal is a lever that is depressed by the operating engineer's foot. If he should take his foot off of it, it will actuate the penalty application of brakes.

Q. I'll ask you again. Apparently I didn't make myself clear. But a criticism of the deadman pedal is that it might not operate the brakes even though the engineer is incapacitated because he might continue to keep pressure—— A. It's possible that it might happen that way, but being in existence for all of these years with so many men actuating it, I think it is a slim possibility.

Q. But all you can positively tell us is from your experience? You do not know of any condition where pressure remained on the pedal where the engineer was incapacitated? A. I have heard of it but I have never seen it and I don't have direct intimate knowledge of it.

Q. And the Vapor alerter is to require constant activity on the part of the engineer? A. Yes, sir.

Q. And how it is operated, electrically? A. Yes, sir, by completing a circuit with a man's body electronically.

Q. Is this a very sophisticated electronic piece of equipment? A. Well, frankly, not in the light of today's space age. It is a rather simple device.

Q. Are you familiar with its circuity? A. I can't draw you a diagram on it, no.

Q. Could you tell us part of the components? A. Well, it has an antenna in the seat box and when the engineer makes or breaks a metallic connection with the ground site in the cab, it actuates this electronic box which has a circuit board built into it and it is a solid state device

with no moving parts and there is a timer in the circuit. If the engineer's activities are not within the time range set in the device, it will sound alarm.

Q. Are these systems systematically checked for operation? A. Yes, sir. They are checked every time that they are not—well, you can just merely check them by sitting in the engineer's seat and not taking any action over the time period and it will start to functioning. It is a very simple task.

Q. Do you know to your personal knowledge if there has been any malfunction of these devices? A. Yes, sir, there have, but they are functioned on the safe side.

Q. Malfunctions that you are familiar with have required breaking of the train to stop the train, is this correct? I didn't understand your answer. A. There has been fail safe malfunctions in that the buzzer sounded and then the brakes applied.

* * * *

Re-Redirect Examination,

By Mr. Light:

Q. Mr. German, does the picture at Page 42 of your testimony fairly represent the view available to an engineer in the seat of the cab of that locomotive? A. Yes, sir.

* * * *

PLAINTIFFS' EXHIBIT NO. 23—**Exhibits to Testimony of John G. German.**

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 24—**Testimony of Raymond R. Rich.**

My name is Raymond R. Rich. I live at 1410 South Tyler Street, Little Rock, and am Master Mechanic for

Chicago, Rock Island and Pacific Railroad Company stationed at Little Rock. My duties are to supervise the maintenance of locomotives, freight cars and other rolling stock. While my headquarters are at Little Rock, my territory extends from Memphis, Tennessee westward through Little Rock and Mansfield, Arkansas to Shawnee, Oklahoma and from Little Rock south through El Dorado, Arkansas and Alexandria, Louisiana to Eunice, Louisiana and includes all branch lines. I am responsible for the maintenance of an average of 40 freight and yard locomotives daily which number includes 13 yard and road switcher locomotives permanently assigned to my care at Little Rock.

My first railroad experience was with Chicago-Burlington and Quincy Railroad, as a fireman, in 1922 operating out of Trinidad, Colorado south to Texline, Texas near the state line of New Mexico and Texas, and north to Pueblo, Colorado. At that time almost all locomotives were hand-fired, coal-burning saturated steam locomotives.

In order to qualify as a locomotive fireman, beginners were required to make student trips with a qualified fireman. I made about 5 student trips each direction from Trinidad, and it took about 20 days of riding with experienced firemen before I was qualified even to maintain steam pressure and operate injectors which supplied water to the boiler, under the supervision of an experienced locomotive engineer. Student trips were made without pay. With experience I became proficient at performing all the duties of a fireman on a steam locomotive.

In 1923 I was furloughed from the Burlington because of force reduction and in 1924 I was employed by the Chicago, Rock Island and Pacific Railway Company at Dalhart, Texas as a fireman. Due to the fact that I was low on the firemen's seniority roster, I also signed up with the Rock Island as a brakeman and worked as a brakeman between Liberal, Kansas and Tucumcari, New Mexico for

a period of about four months. After a brief furlough, I returned early in 1925 to work for the Rock Island as a fireman on the territory between Liberal, Kansas and Tucumcari, New Mexico. Late in 1925 I was furloughed and found employment with the Southern Pacific Railroad as a brakeman operating between Blue Canyon, California on the west to Carland, Nevada on the east with headquarters at Sparks, Nevada. East from Sparks we operated in the desert. Westward, we operated across the high Sierra Nevada Mountain Range.

Early in 1926 I was recalled to the Rock Island as a fireman and returned to Dalhart, Texas in the territory between Liberal and Tucumcari. I worked regularly as a fireman, with intermittent short furloughs, from 1926 to 1931.

In May 1929 I completed examinations and qualified as a locomotive engineer. In order to qualify as a locomotive engineer, I had to prepare for and pass a written mechanical examination on steam engines consisting of 600 questions and also to prepare for and pass a written examination on operating rules also consisting of about the same number of questions. Once I became qualified as an engineer, I was permitted to work as such only when the seniority roster of engineers was exhausted and all firemen senior to me had been called. However, these occasions did arise from time to time and I made a number of trips as an engineer between 1929 and July 1937 when I advanced to the engineer's seniority list. From that time on I was employed more and more as an engineer although as the demand for engineers decreased I returned to service as a fireman and for a short time in 1935 I worked as a fireman on both hand-fired and stoker-fired locomotives on the Denver and Rio Grande Western Railroad between Denver and Pueblo, Colorado, but mostly in yard service in Denver. Early in 1936 I returned to service with the Rock Island at Dalhart, Texas as a fireman and engineer.

I continued in this service until September 1942 when I was appointed Road Foreman of Equipment headquartered at Fort Worth covering a territory extending from El Reno, Oklahoma to Galveston, Texas. The operation in this territory was unusual. Between El Reno and Fort Worth it consisted of operating Rock Island freight trains over Rock Island track. From Fort Worth to Galveston we operated joint freight trains with crews comprised of employees of three different railroads running over the tracks of six different railroads and terminal companies. Between Fort Worth and Dallas, 34 miles, the joint trains operated over Rock Island tracks with the trains of the Frisco Railroad operating on the same track for 12 miles between Irving and Dallas, Texas. From Dallas to Waxahachie, Texas, approximately 90 miles, the joint trains continued over the track of the Missouri, Kansas and Texas Railroad Company. At Waxahachie the trains continued to Houston, Texas over the track of the Burlington-Rock Island Railroad Company which was a separate railroad company owned equally by Chicago, Rock Island and Pacific Railroad Company and Colorado and Southern. At Houston the trains operated on the property of the Houston Belt and Terminal Company, thence by way of the Atchison, Topeka and Santa Fe to Galveston where they were tied up in a yard owned and operated by the Southern Pacific Railroad.

The duties of a Road Foreman were to train firemen to become engineers and to instruct engineers in the proper performance of their duties both as to mechanics and to operating rules. I was also an operating rules examiner with authority over all conductors, brakemen and switchmen, as well as firemen and engineers, to insure their compliance with Operating Rules. It was also the duty of the Road Foreman to supervise the maintenance of all equipment as the mechanical officer when the Master Mechanic was not present. As Road Foreman I was transferred to Little Rock in December 1942. I continued as Road Fore-

man of Equipment headquartered at Little Rock until July 1960 when I was appointed Assistant Superintendent of the Arkansas Division with headquarters at Little Rock.

As Assistant Superintendent I was responsible for seeing to it that not only train and engine employees but also station service and yard employees—that is to say, all operating employees—on the Arkansas Division performed their duties in line with Operating Rules and special instructions. At that time the Arkansas Division embraced the same general territory that my responsibility as Master Mechanic now covers.

I continued as Assistant Superintendent from September 1960 to February 1963, at which time I was appointed Master Mechanic, the position which I now hold. In February and March 1966 I served in the dual capacity of Master Mechanic and Assistant Superintendent during the illness of the regular Assistant Superintendent.

Although I have been headquartered at Little Rock since 1942, I have been given many special assignments which have required my presence in one kind of locomotive cab or another on nearly all of the Rock Island system.

In the late 1940s I was assigned to instruct engine crews in the firing and operation of oil-burning locomotives. Oil-burning locomotives had been used on the Rock Island in the territory south of Kansas City since 1929, but the Company continued to use coal-fired steam engines on the Northern District until a coal strike created a fuel crisis, making it necessary to divert some oil-fired engines to the North. At that time I worked principally on passenger trains on the territory between Minneapolis and St. Paul, Minnesota and Kansas City, Kansas, for a period of about 30 days until the crisis eased. Since the engineers and firemen on the Northern District had had no experience in the operation of oil-fired locomotives and

maintenance crews had had no experience with fueling the engines, it was necessary to have a supervisor on board with them at all times to observe both the operating and fueling operations until the coal shortage ended and they returned to the normal operation of coal-fired engines. I would make the entire trip between Kansas City and the Twin Cities, a distance of 390 miles, resting 10 to 12 hours and then return over the same territory. It took three separate engine crews to make the run from Kansas City to St. Paul, and three to make the return, but the three returning crews were not always the same ones who made the trip up.

In 1944 the Rock Island began to replace steam locomotives with diesel powered locomotives. In 1941 two new diesel locomotives were assigned to a passenger train which operated between Chicago, Illinois and Phoenix, Arizona. I was working as a fireman although I held seniority as an engineer and had worked as such regularly until a seasonal decline in business forced me to exercise my seniority as a fireman. As a fireman on this passenger run in the territory between Liberal, Kansas and Tucumcari, New Mexico, I became qualified to operate diesel locomotives under the instruction of a road foreman of equipment and an instructor assigned to the new locomotives by the manufacturer to educate the operating personnel.

The transition from steam to diesel power was interrupted by World War II, but in 1948 was reinstated on a large scale. After I became Road Foreman of Equipment in 1942, I supervised engineers and firemen in passenger service in the operation of diesel passenger locomotives. In 1946 as a Road Foreman on special assignment, I placed diesel-powered locomotives in service on our premier passenger train, The Golden State Limited, between Kansas City, Missouri and Tucumcari, New Mexico. It took five engine crews to make the trip, but I stayed

on during the entire journey as their supervisor and instructor.

In 1948, I took a special assignment to place diesel power in freight service between St. Louis, Missouri and Kansas City, Kansas. This territory is quite similar to the territory between Shawnee, Oklahoma and Memphis, Tennessee, in that there a number of hills, curves and rivers to cross, as well as level terrain in both territories. This assignment lasted about 30 days at which time I was returned to Little Rock to inaugurate diesel freight operation between El Reno, Oklahoma and Memphis, Tennessee.

Later I supervised the complete transition from steam to diesel power in territory between Little Rock and Alexandria, Louisiana, as well as on all branch lines on the Arkansas Division.

In November 1967 I expect to retire after 45 years of railroad service. I have served the Rock Island in many capacities over most of its system. Having worked in various sections of the country as a fireman on coal and oil-fired steam locomotives and diesel locomotives and as a brakeman on steam powered trains, I know from experience that a change in geography does not change the duties of a fireman on any type of locomotive and the same is true with respect to brakeman. When I was a head brakeman on a steam train, I was the primary lookout man on the left side of the engine cab. When I was a fireman, the head brakeman, and not I, was the primary lookout on the left side of the cab.

On coal burning steam locomotives, the fireman had three principal duties. The first was to maintain the fire so that sufficient steam pressure was available; the second to maintain a sufficient water level in the boiler; and the third, when other duties permitted, to keep a lookout on his side of the engine. He had other duties which I will mention, but these three were the main ones.

The first thing the fireman had to do when he boarded his locomotive was to check the fire in the firebox. If it was not heavy enough, he had to operate a manual blower in order to increase the draft and take the fire rake and level the bank down. Most of the time he had to have additional coal in order to have plenty of burned-through, glowing coke fire to cover the entire grate area before his assignment or trip began. The coals in the firebox had to be well burned through and evenly distributed over the grate. If green coal got next to the grate, it caused trouble. The green unburned coal would cause cool spots or, as we called them, "dead spots" in the fire and would also cause clinkers or holes.

After the fireman had prepared his fire for his trip or assignment, he checked the supplies on hand which would include water in the water tender, the supply of coal on hand, and such other items as fusees, torpedoes, signal flags, broom, shovel, valve oil for the lubricator, engine oil for the reciprocating parts, grate, shaker bar, fire rake, waste, spur headlight, lamp lanterns and train order hoop, and he checked the tool box which contained a hammer, chisel, monkey wrench and rod cup wrench, as well as a supply of pin grease. As a general rule, he had to fill the oil can for the engineer and to provide his own ice and drinking water. The cab of the locomotive was washed down, including the boiler head, and the hydrostatic lubricator was blown out and filled with valve oil. The fireman was issued a scoop shovel. When I began firing, the standard issue was a No. 2, but as the locomotives became larger, the size of the scoop shovels got larger. The largest ever issued to me was a No. 5, but I bought a No. 8 shovel to enable me to distribute coal more evenly over a larger area. All this work was done while the engineer was engaged on the ground inspecting the running gear of the locomotive.

The fireman always oiled the two supporting bushings

that held the bell and the air motor which was operated by the engineer by a valve on the right side of the cab. With all the work he had to do, the fireman could not be depended upon to maintain a constant lookout in the direction the locomotive was moving or to ring the bell when necessary. However, there was a cord attached to the bell and if the air motor became inoperative, the engineer instructed the fireman to ring the bell manually by pulling the cord.

During the course of each trip or assignment on hand-fired, coal-burning engines, the fireman devoted more than half of his time shoveling coal into the firebox so that adequate steam pressure could be maintained to operate the locomotive. Another 15% or so of his time was spent regulating the flow of water into the boiler and checking gauges, lubricator, shaking grates to sift ashes from the firebed to increase the efficiency of the engine. As I have mentioned, the fireman had to shovel coal into the firebox, but a good fireman did more than merely shovel coal into the firebox. He did that, to be sure, but he did so at a rate or pace which would permit proper burning of the coal, taking care that it was spread as evenly as possible in order to permit an even draft and even burning throughout the firebox. If the coal was not evenly spread, holes were likely to develop in the fire, resulting in too much draft which caused the engine to lose steam. On the other hand, if clinkers formed, they obstructed the passage of air through the firebox with the result that combustion was impaired and steam pressure would drop. A tender loaded with coal was pulled behind the engine and the fireman scooped the coal from the tender and threw it into the firebox. After a short running time and consumption of coal at the front end of the tender, he had to move coal from the back of the tender to the front prior to shoveling it into the firebox. The railroad companies employed coal passers to perform this duty at

intermediate stations, but it was up to fireman to move the coal while the train was in motion. With each shovelful of coal, it was necessary to open the fire door prior to throwing the coal into the firebox and to close the fire door immediately afterward. When I began my career as a fireman, all of the fire doors were manually operated, which meant that I had to open and close the door by use of a chain which I manipulated with my left hand while I was turning to the right to fill my scoop with coal from the tender. I would then use both my hands to fill my shovel with coal and deposit it on the fire and then close the door again with my left hand. In later years the fire doors on most coal-burning steam locomotives used in road freight service were opened and closed by use of a pneumatic device operated by a foot pedal. A hand-firing fireman on a steam locomotive had to be a pretty good man. He had to be strong, skillful, agile and have a good working knowledge of his equipment in order to perform properly on a locomotive operating at high speed. He had to stand with one foot on the cab floor while the other foot rested on the cab apron which overlapped the locomotive cab and tender decks, pivoting one way and then the other as he kept up his shoveling routine. As the locomotive gained speed, it would sway from side to side and would bounce up and down even on the best maintained track and roadbed. If the roadbed were rough or the mechanical condition of the locomotive run down, the engine rode rougher and made the job of the fireman even more difficult. Other difficulties encountered were partial stoppage of the flues, honeycombing of the flue sheet, leaking flues, leaking superheater units, and air leaks around the front end of the smoke box might occur. All made it extremely difficult to maintain adequate steam pressure. These conditions required continuous presence of the fireman on the deck of the locomotive during the entire assignment or from one end of the road trip to the other.

It was not uncommon to shovel between 14 and 18 tons of coal into the locomotive firebox on one trip of a heavily loaded road freight train. The most coal I can recall having shoveled in the shortest time was on the "Valentino Special". When the motion picture actor, Rudolph Valentino, died in New York, his body was returned to California on a special train, and I fired the locomotive on that train between Liberal, Kansas and Dalhart, Texas. We covered 111 miles in two hours thirty-five minutes and during the course of the run I shoveled between 15 and 16 tons of coal into the firebox.

Of course, as the coal burned, it left a residue of ashes, dirt and clinkers. Anyone who has had experience with a wood or coal burning stove can appreciate the fact that this residue will impede the burning of the fire and has to be removed in order for the fire to burn at maximum efficiency. All locomotives were equipped with an ash pan below the grate and one of the duties of the fireman was to shake the grate with a heavy metal grate shaker bar, permitting the ashes to sift through the grates and down into the ash pan below the firebox.

I am sure everyone understands that the purpose of maintaining a hot, even-burning fire was to convert water into steam which, in turn, transmitted energy through a series of pipes to the pistons attached to rods that coupled all driving wheels of the locomotive. Water was maintained in the boiler, and it was one of the important duties of the fireman to see that neither too much nor too little water was in the boiler for conversion into steam. Too much water resulted in excessive use of fuel and could cause foaming. Too little water in the boiler could result in a boiler explosion and subject the engine crew to the hazard of scalding to death. Locomotives with superheated units would increase the temperature of a saturated steam from approximately 380° F. in a boiler of 200 pounds pressure per square inch to approximately 600°

or 700° F. when superheated. This higher temperature and dryer steam, which resulted from passing saturated steam through superheater units housed in the boiler flues between the throttle dome and the valves of the locomotive, made a far more efficient locomotive. It was necessary to maintain a light, bright fire over the entire grate area and to carry water as low as conditions would permit to prevent water from being carried over into the dry pipe and into the superheater units. If water got into the superheater units, we would lose the effect of superheating the steam because the water would have a cooling effect on the superheating units. This meant that the fireman had to check the water gauge frequently and at least once on every trip he was required to open a test valve to be certain that the water gauge was working properly and that the water in the boiler was at the safe level the gauge indicated it was. Additional water was carried in the tender and was injected into the boiler during the course of a trip to take the place of water which had been consumed. This meant that the fireman also had to keep a watchful eye on the quantity of water left in the tender. The fireman had to keep a frequent check on the quality of his fire which normally burned at a temperature between 2200° and 2800° F. in the combustion chamber and superheater flues. This heat and the intense brightness of the fire affected the eyes of the fireman, especially at night, to the extent that it would be several seconds, or perhaps minutes, before he could adjust his eyesight to enable him to inspect gauges or perform his many other functions. The fireman had to know what to do about each of these situations and how to feed his fire in each of them. He had to know his railroad and how to regulate the delivery of the coal to the firebox in direct relation to the operation of the locomotive by the engineer. The skilled steam locomotive fireman and engineer worked as a team and, as such, were

as integral a part of the locomotive as were valves, gears, or any of the essential reciprocating parts. Remove one of them from the picture and there would have been no train movement.

When his other duties permitted, the fireman helped to keep a lookout on the left hide of the locomotive.

During the decade of the '20s, mechanical stokers were introduced on the larger new coal-fired locomotive. The older ones continued to be hand-fired, regardless of size. The stoker was a device operated by the fireman to supply coal to the firebox mechanically. While it lightened the physical labor of shoveling, it required the fireman to devote his attention to the manipulation of a greater number of valves and the observation of an increased number of gauges. The fireman still had to coordinate this work with the engineer. In addition to handling the numerous valves and gauges, the engineer communicated with the fireman either by audible signal or hand signal to indicate the changes he expected to make in the operation of the locomotive and the fireman had to take appropriate action to increase or decrease the coal supply to the firebox. One of the best indications the fireman had to judge the condition of his fire was to watch the smoke stack to observe the color of the smoke being emitted. If the smoke was black, it meant that too much coal was being supplied and not being completely burned. This told him to reduce the coal intake. If the smoke were too white, it would indicate that there was an oversupply of air or a hole in the fire which interfered with the proper burning of the coal. To remedy this, the fireman had to take immediate action to correct the condition. Frequently he had to add coal with a shovel to a particular area of the firebox which could not be reached with the stoker. The stoker did not completely replace the shovel.

The stoker was run by a small steam engine operated

by the fireman which ran an auger or chain conveyor bringing the coal from the tender under the locomotive deck up to the inside of the firebox. I have already referred to the importance of making an even distribution of coal over the grate in the firebox. With the stoker, the fireman still had to look into the firebox to observe the condition of his fire. He had a series of steam jet valves on the left side of the cab with which he could, by controlling steam jet flows in several directions inside the firebox, carry the coal to the desired location on the grate. When getting a heavy train under way, the fireman was completely absorbed in controlling the flow of coal into the proper places on the grate to maintain adequate steam pressure. With the advent of the stoker, the fireman did not become the primary lookout man. He had too many other duties to perform. The later stoker-equipped engines had a water pump to supply water to the boiler, whereas on the hand fired type, water was taken into the boiler by means of a steam-operated injector. Both required the fireman's careful attention.

In about 1926 Rock Island converted a number of its engines used in Arkansas to burn crude oil as fuel. While the oil-burning mechanisms, like the stoker, lightened the physical labor of the fireman because he was not required to shovel coal, still he was required to tend a fire and to regulate the amount of steam pressure in the boiler in close coordination with and at the direction of the engineer. The job of the fireman on an oil-burning locomotive was closely akin to that of a fireman on a stoker fired coal burner, and what I have said with respect to stoker fired steam locomotives can be said with equal force with respect to oil-fired locomotives. To emphasize the importance of a fireman watching the color of smoke coming out of the smoke stack, an electric light bulb was mounted in front of the stack and directed toward the cab so that the enginemen could observe the

smoke. This light, which was installed on every oil burning locomotive I have ever seen, was run from the generator which furnished cab lights and the headlights. It burned all the time the generator ran. To the fireman, this light was perhaps the most important light on the engine outside of the headlight. He would frequently remove a good bulb from the cab to replace a burned out smokestack light. On those occasions when the fireman could take his seat, he would look ahead, but his primary lookout was upward toward the stack to observe the smoke.

On a steam locomotive, the fireman, when not required to perform the duties which I have described, had a seat on the left side of locomotive in back of the head brakeman and shared with him the duties of looking out ahead and behind.

During the course of a trip, it was the normal thing for a freight train to stop at some point along the line to take on additional coal and water. When these stops were made, the fireman was responsible for taking coal on the tender from overhead coal chutes. The coal was kept in pockets containing various amounts of coal and it was up to the fireman to select the pocket with the right amount of coal to get his train from one coaling stop to the next. Once he had selected a pocket of coal and had lowered the chute, all the coal in the pocket rushed into the tender. If he made the mistake of pulling down a chute from a pocket with too much coal, the tender would be filled to overflowing and the excess would crash into the cab and on both sides of the locomotive, resulting in a waste of coal and a reprimand for the fireman. Similarly he was responsible for taking on water into the tender. To do this, he positioned a spout located on a moving crane near the track over the manhole in the tender and opened the valve. To permit the water to run into the tender, it was necessary for the fireman to stand on the spout while the water was pour-

ing into the tender because the pressure would otherwise raise the spout and send the water all over the tender. His third duty at coaling stops was to empty the ash pan. It was often necessary to use a device known as an ash pan hoe to dislodge clinkers and ashes from the ash pan. It was not unusual for steam locomotives maintained for assignments at outlying points to require mechanical attention on the part of the engine crew. I have performed such work on locomotives as applying brake shoes, adjusting brake rigging, filling rod cups, keying up main rods, and cleaning out the front end of the smoke box and netting which became clogged from sweating due to changes in temperature. Most locomotive engineers required that the fireman sprinkle down the coal in the tender frequently and adjust the canvas curtain at the rear of the locomotive so as to minimize the amount of coal dust blown into the cab. There is nothing comparable to these tasks, either in skill, effort, or in necessity for safe operation on the modern diesel locomotive.

In the days when trains were propelled by steam locomotives, three men were assigned to the cab of the locomotive just as they are today in Arkansas in the cab of a diesel locomotive pulling a road freight train. These men were the engineer, who occupied a seat on the right side of the locomotive, the fireman, some of whose duties I have just described, and a head brakeman. The head brakeman was the primary lookout on the left side of the cab. He was always assigned to the locomotive cab and was required to keep a lookout ahead and to check the train behind, particularly when rounding curves, to detect hot boxes, dragging equipment or other abnormal conditions. Today he is assigned to the leading unit of the diesel locomotive and also acts as a flagman when the train is stopped, and couples and uncouples cars when a switching movement is required. He is always in the cab of a road freight train when it is enroute from one station to another.

The diesel fireman of today does none of the work which I have described except for the task of keeping a lookout ahead. With the passing of the firebox, there are no longer any fires to attend or any boilers or reciprocating driving parts to inspect and if I may be indulged an opinion, it makes no more sense to require a fireman on a diesel locomotive today than it would to require the maintenance of a coal tender behind the diesel locomotive. The need for both is totally absent.

The diesel locomotive is hardly comparable to the steam powered locomotive. The basic components of a diesel locomotive are (1) an internal combustion engine which operates on diesel fuel to drive an electric generator; (2) the electric generator which supplies electric power to traction motors; and (3) electric traction motors which transmit power through a gear mechanism to the driving wheels of the locomotive. The engineer drives the locomotive by operating a throttle lever which increases the speed of the diesel engine, which increase the electrical output of the generator and the speed of the traction motors. The locomotive has a braking system, of course, which includes an air compressor and air reservoirs which supply air to the brakes of the locomotive and train. There is also an auxiliary generator run off the diesel engine which supplies electricity, in a lower voltage than that generated to run the traction motors, for lights, control systems and other purposes. The engineer operates the locomotive and the component systems I have mentioned by means of control instruments located on the right side of the cab within easy reach from the engineer's seat. When operating in road freight service, the fireman generally sits on the left side of the cab in a chair located either beside or behind the seat of the head brakeman depending upon the type of locomotive, although in some locomotives the fireman sits in the middle of the cab between the engineer and head brakeman.

The fireman has little to do except to maintain a lookout and as a lookout he is superfluous. The head brakeman has always been the primary lookout man on the left side of the cab. On steam locomotives the head brakeman was the only lookout on the left side of the cab most of the time while the fireman shoveled coal, regulated water intake, checked gauges or performed the other duties which I have described with respect to stoker or oil fired engines. The superfluity of the fireman's position as a lookout is further accentuated by comparing the visibility from the cab of a steam locomotive with that from the cab of any type of diesel locomotive in service today. The cab of a steam locomotive, as everyone knows, was located to the rear of the long steam boiler which extended a considerable distance ahead. Forward visibility was through tiny windows located on the right and left sides of the cab and well below the top of the boiler. Consequently the fields of vision of the engineer and head brakeman were limited. Neither could see an object on the opposite side of the engine unless it was well ahead of the forward part of the locomotive. Moreover, steam and smoke belching from the smokestack further obscured visibility from either side of the cab. On diesel locomotives the crewmen look out from the cab through broad panels of safety glass with little or no obstruction of their view and, of course, no smoke or steam to becloud their vision. In today's diesel locomotive, the engineer alone can see a great deal more than the engineer, head brakeman and fireman combined could see from the cab of a steam locomotive.

The importance of keeping a lookout is not to be minimized, but with the engineer and head brakeman stationed in the cab, there is no need for a third lookout. In fact, the inclusion of a third man in the cab tends to be a detriment from a safety standpoint because it stimulates conversation with corresponding diversion of

attention. On passenger trains, there are only two men in the cab of the locomotive and I know of no occasion when a passenger train accident has been attributed to the absence of a third lookout in the cab.

With the development of the diesel locomotive, the duties which were once considered to be exclusive to the fireman's craft have disappeared. He spends 90% or more of his time looking out the window. From time to time firemen do perform simple routine functions which other members of the crew can, and often do, perform.

It is frequently contended by the firemen's union that firemen are needed to prevent accidents in the event that the engineer should die or fall seriously ill while at the controls of his locomotive. Occasions when the engineer has become incapacitated in the course of a trip have been extremely rare. In any event, the head brakeman is perfectly competent to stop the train and has an emergency brake lever within easy reach of his seat. The head brakeman is qualified on operating rules and can fulfill any function which the fireman now performs. He knows the characteristics of the railroad and can summon help if necessary either by radio or by use of one of the telephones which are installed at every siding.

The presence of a fireman would contribute nothing to safety in such instances although if the fireman were also qualified as an engineer—and not all of them are—he could minimize train delay by bringing it to the next terminal. If there were no one else qualified to operate the locomotive, an engineer would be dispatched from the nearest terminal to complete the run. This would result in moderate delay of the train, but delay does not jeopardize the safety of train crews or the public.

The diesel electric locomotive with its interdependent mechanical and electrical systems is a complex machine and an extremely dependable one. They are maintained and given frequent detailed inspections by railroad me-

chanical and operating employees in order to comply with the regulations of the Interstate Commerce Commission. Occasional malfunctions of the equipment do occur and when they do, automatic fail safe devices operate to shut down the affected engine or reduce it to idling speed. They also activate an alarm bell in the cab or warning light on the engineer's control panel. The action which a member of the engine crew may take to remedy the malfunction is in almost every instance simply a matter of pushing a button or pulling a lever. The railroad does not provide tools for the engineer or fireman to work on the locomotive and discourages their attempting to do more than make routine responses to alarms. When diesels were introduced there were a number of manual corrections which the engineer or fireman made in response to engine malfunction but it soon became apparent that a very few enginemen were competent to handle repairs enroute. In some instances serious damage to equipment resulted from well intended but misguided tinkering. In others, personal injuries to crew members resulted when an engineman tried to make a component, which he did not understand, function in a way it was not designed to operate. Consequently tool boxes were removed; signs were stencilled on generators and electric cabinets warning of the risk of high voltage electricity; and newer locomotive models were designed to make it difficult, if not impossible, for enginemen to gain access to any of the vital working parts of the equipment.

There are four principal fail safe or warning devices which operate automatically to protect the equipment and warn the engineer of malfunction. The first of these is the ground protective relay which protects the several components of the high voltage electric system which includes the main traction generator, the traction motors and a high voltage switch gear. When a ground occurs in any part of this system, the ground relay automatically

cuts off power to the traction motors and reduces the diesel engine to idling speed. There are usually two diesel engines and four traction motors in each road freight locomotive unit. Consequently the functioning of the ground relay normally merely reduces available motive power. When the relay functions, it also activates an alarm bell or warning light on the engineer's control panel. Since the engine will have been automatically put at idling speed, the engineer can proceed to the next stopping point before doing anything about the alarm without doing harm to his equipment. Usually, however, the engineer will want to silence the alarm and may send the fireman to determine which unit is affected and take appropriate action. On later model locomotives a button is provided at the engineer's control panel so that the engineer can reset the ground relay without moving from his seat. The prescribed procedure in such cases is for the person attending the alarm to reset the ground relay by pushing a button in the cab of the affected unit. If the ground relay trips again, the engine should then be isolated so that the alarm will stop. The train may then proceed under reduced power. If the train cannot proceed without the power of the affected unit, it will be necessary for the engineer to obtain assistance from mechanical forces. Obviously the engineer or head brakeman can push the button or turn off the engine as well as the fireman. There is nothing that the fireman can do that the engineer or head brakeman cannot do with complete safety.

Another malfunction warning device is the overspeed trip. Diesel engine speed is controlled by a governor. If the engine operates at a speed greater than 10 per cent above its prescribed maximum, the overspeed trip stops the engine and activates an alarm bell. All diesel locomotives have a manual overspeed reset which is operated either by pushing a button or pulling a lever, depending on the model of the locomotive. This simple

task requires only one man. When it has been determined which of the units is affected by the overspeed trip, the alarm can be stopped and the engine restarted or isolated if necessary. The engineer can with complete safety stop his train and attend the alarm, and there is no reason why the head brakeman cannot take care of it. Safety does not require the presence of a third man in the engine crew to push the reset button whether you describe him as a fireman or by some other name.

A third type of malfunction that sometimes occurs is loss of lubricating oil pressure. If the engine were permitted to run with low lube oil pressure, serious damage could result. Consequently when oil pressure goes below a prescribed minimum, an automatic device shuts off the engine and activates an alarm in the form of either a light, bell or buzzer, depending upon the model of locomotive. If this should happen, the engineer should follow a procedure similar to that described with respect to the ground relay and overspeed trip, and, as with the other malfunctions, the only immediate effect of a low oil pressure shutdown is the loss of power from the affected unit. If the cause of the alarm is insufficient oil, and if an extra supply is available, any member of the engine crew can add oil and restart the engine. Any other cause of low oil pressure is likely to be serious and beyond the skill or mechanical knowledge of the engine crew. Therefore, the engine is equipped so that when restarted it will automatically shut down if normal oil pressure is not attained within 45 seconds. On early model diesel electric locomotives, the low oil pressure device merely reduced the engine to idling speed and it was up to the fireman or engineer to decide whether the engine should be shut down. This resulted in the loss of or damage to a number of engines and the inclusion of the automatic cut-off in later models and replacements. Neither the engineer or fireman should attempt a correction of this situation other than to add

oil. If the engine then will not run, it should be left alone until qualified mechanics can give it proper attention.

The fourth type of malfunction that sometimes occurs is an overheated engine. When engine temperature rises too high, an automatic device shuts down the engine and activates an alarm. The engineer can nullify the alarm and proceed under reduced power to the next stopping point. If it is necessary to operate the engine, the engineer or any other member of the engine crew can check the cooling water level and add water if needed or adjust the position of the air shutters if an adequate supply of water is on hand. Any further correction would require a trained mechanic. In any event, the services of a fireman are unnecessary.

The situations I have described cover the principal malfunctions that affect diesel electric locomotive operation. Occasionally a fuse has to be replaced or some other minor matter requires attention but in none of these situations is a fireman necessary for the safe operation of the locomotive. The engineer can effect any correction which does not require trained maintenance personnel. In most cases it is possible for the engineer to continue the train to the next terminal under reduced power with the affected unit shut down or at idling speed.

The engineer would have to stop the train if he were to correct these malfunctions, but stopping a train does not impair safe operation. In this connection I should point out that while the earlier model locomotives were of the car body or, as we called them, "covered wagon" design which housed the diesel engine and traction motors in an engine room, newer locomotives are the hooded type which have no engine room but provide access to the engines only from the outside through side door panels reached by a walkway along either side of the unit.

We on the Rock Island instruct our men not to make engine inspections or respond to alarms on hooded locomotives, which have no walkways between units, while their train is in motion. On the older car body types, a man could easily go from unit to unit in the locomotive consist checking each engine room as he went. On hooded type locomotives with no walkway between units, the train should be brought to a stop before a man from the cab goes back to answer an alarm. The malfunctioning of a modern diesel is not a frequent occurrence and delays resulting from stopping the train to correct them are inconsequential. The fireman in these cases, however, cannot even contribute to the elimination of delay.

My testimony with respect to the redundancy of firemen on diesel locomotives is not based upon mere hypothesis. The modern locomotive is a descendant of several types of railroad locomotives powered by internal combustion engines. Most people are familiar with the motor car equipment which many railroads have used in an effort to solve passenger service problems. The motor car is a self-propelling car operated at relatively high speeds manned only by an engineer, or motorman as he was often called, and a conductor. This equipment usually provided a cab in the front for the engineer, an engine compartment to his rear and seats for from 25 to as many as 79 passengers and their baggage. The first of these were powered by gasoline engines, but in about 1927 the Rock Island acquired seven diesel electric motor cars for use on various parts of its system. These units employed the same principle for transmitting power to driving wheels as the present day diesel electric locomotive in that diesel engines were used to turn generators to produce electricity. The electricity so produced operated traction motors which in turn, through a system of gears, turned the driving wheels.

When I was transferred to Little Rock in 1942, the Rock Island operated several of these units in Arkansas.

One was assigned to operate between Memphis and Little Rock daily in each direction. It was manned by two men only—an engineer and a conductor. Another was operated with only two men between Little Rock and Winnfield, Louisiana, in both directions daily. These units were locomotives in the true sense of the word. They weighed up to 200,000 pounds on drivers and could pull other passenger cars behind them.

In the late 1940's and early 1950's, the Rock Island operated passenger service between Little Rock and Hot Springs utilizing diesel electric motor car units to pull two trailing units. This three unit train operated daily in both directions with a crew of one engineer, a conductor, and one brakeman. Beginning in 1953 and continuing to 1963, Rock Island operated so-called Budd Cars between Memphis and Amarillo, Texas. These Budd Cars, named for their manufacturer, were streamlined diesel powered units which sometimes pulled one or more passenger coaches. They were operated singly with only an engineer and conductor. When additional passenger cars were added, a brakeman was also assigned.

For a period in excess of 21 years to my personal knowledge Rock Island operated the diesel electric equipment I have just described over all parts of its main line in Arkansas. We provided service that was both dependable and safe without once having assigned a fireman to the train.

While my testimony thus far has related primarily to the need for firemen on diesel electric locomotives in road freight service, it is equally applicable to the need for a fireman in switching service. Some switching locomotives are smaller and less powerful than road freight locomotives, but a great many are general purpose locomotives used in both freight and yard service. In any event, they are the same basic type of equipment and the duties of a fireman are the same in both types of service. Switching service is conducted at low speeds either in a railroad yard

or over short distances to and from industrial plant sites. In road freight service and in switching service, crews are required to pick up and set out cars. In states where no excess crew laws are in effect, Rock Island, pursuant to the award of Arbitration Board No. 282, has eliminated firemen from most of its switch engines and now operates switch engines with a crew of an engineer, switch foreman and one, or at most two, helpers, depending on the assignment. For example, at Memphis, Tennessee we employ four switch engines. Three of them are manned by four-man crews while the fourth is manned by a six-man crew because part of the work of one engine is performed in West Memphis, Arkansas and is so manned in order to comply with the Arkansas Excess Crew law. The work of all four engines is the same.

In other states which adjoin Arkansas, we operate freight trains without firemen and in one instance with only an engineer, conductor and one brakeman. Trains 35 and 36 operate between El Dorado, Arkansas and Alexandria, Louisiana in daily service. When the train leaves El Dorado, it is manned by an engineer, fireman, conductor and three brakemen. We could dispense with the services of one of the brakemen at the Louisiana state line, but because there are no food or lodging facilities there, we drop him at Ruston, Louisiana. The firemen on this job have been employed by Rock Island long enough that they are guaranteed a job, pursuant to the award the Arbitration Board established by Public Law 88-108, until they retire, die, resign or are discharged for cause. They will not be replaced when they cease to be active employees. We operate another train between Alexandria and Eunice, Louisiana daily with only an engineer, conductor and one brakeman and have done so since May 1964. We have never in that time had an occasion when a fireman or second brakeman was needed.

On the trains Rock Island operates through Arkansas

into Oklahoma, the third brakemen are dropped a short distance after entering Oklahoma from Arkansas for the same reason we take the man to Ruston, Louisiana on the trains from El Dorado. In none of these cases is there any operating situation in Arkansas different from the adjoining state. The terrain is similar, the grades and curves are similar, and the trains are the same. When a train leaves Little Rock for El Reno, Oklahoma, it always has approximately the same cars in its consist at the end of the trip as it had at the beginning. The same would be true with respect to trains running into other states from Arkansas.

Occasionally someone asserts that safe railroading requires that the fireman be retained so that he can assist in passing signals to the engineer when performing a switch movement either in yard service or when required in road freight service. Better practice, however, requires that signals be passed directly to the engineer by a man standing on the ground on the enginer's side of the train. Unusual situations may arise when the ground man may be out of the sight of the engineer. When this occurs, the Uniform Code of Operating Rules to which Rock Island adheres, requires that the engineer stop. The ground men can then position themselves so as to pass signals directly to the engineer and complete their movement with complete safety. The advent of two-way radio has also facilitated safe, efficient switching operations. Rock Island locomotives are equipped with two-way radio equipment and portable, or walkie-talkie, equipment is provided for men in the caboose. This equipment keeps the engineer in constant contact with his conductor and brakemen.

Although I have addressed myself to conditions which exist on the Rock Island, especially with respect to operations in the State of Arkansas, I have had experience in train operations of other railroads operating in Arkansas. The Rock Island has trackage right agreements with the

other lines whereby we use their tracks between certain points and other agreements whereby other lines operate over Rock Island tracks. Between Kent, Arkansas and Camden, Arkansas, Rock Island trains operate over tracks of the Cotton Belt. Between Brinkley, Arkansas and Memphis, Tennessee, the Cotton Belt operates over tracks of the Rock Island. Between Malvern, Arkansas and Hot Springs, Arkansas, the Missouri Pacific operates over tracks of the Rock Island. The Rock Island operates over tracks of the Kansas City-Southern between Winnfield, Louisiana and Alexandria, Louisiana. I have ridden over these jointly operated territories in the locomotive cabs of trains of all participating lines. I have found the operating procedures on all lines to be practically identical. All of these lines operate under the Uniform Code of Operating Rules. Hence a tenant line train crew is as much at home on the track of a lessor railroad as he is in his own. This type of operation is common practice everywhere railroads are to be found.

My experience as a railroad operating man has extended from the Mississippi River to California and from St. Paul and Minneapolis on the north to Galveston on the south. I have operated or supervised the operation of both steam and diesel electric powered locomotives in the Ozarks, through northern metropolises, across the Sierras and Rockies and across the western plains. I conclude that there are no duties now being performed by firemen manning diesel locomotives that are not duplications of duties performed by other employees or which could not be delegated to another employee already on duty without detriment to safety of overall efficiency. Trains have been operated safely and continuously without firemen since May 7, 1964 in those states where excess crew laws are not applicable. There is nothing peculiar to railroading in Arkansas which renders a fireman or third brakeman necessary for safe, efficient operation.

INTERVENORS' REBUTTAL EXHIBIT NO. 24—
Cross-Examination,

By Mr. Ross:

Q. State your name and address, please, sir. A. Raymond R. Rich, 1410 South Tyler, Little Rock, Arkansas.

Q. What is your formal education, Mr. Rich? A. Roughly, tenth grade.

Q. You completed the tenth grade? A. I wouldn't say "complete" because I didn't have all of the subjects in the 10th grade.

Q. You completed the ninth grade? A. Yes, I think I have, not in an accredited school though understand.

Q. Mr. Richard, when were the oil burning steam engines—I will rephrase the question. When did the Rock Island complete the change-over from hand fired steam engines to oil burner steam engines south of or in the southern district, rather, south of Kansas City. A. I wouldn't know when the completion was made but in 1929, they were pretty well along with converting the engines to oil of the district on which I worked.

Q. That would include Arkansas? A. No.

Q. Isn't Arkansas in the territory south of Kansas City? A. Yes, but at the time of conversion to oil, I was employed as a fireman on what was at that time known as the El Paso division.

Q. I am referring to page 5 of your statement, Mr. Rich, in which you say "oil burning locomotives had been used on the Rock Island in the territory south of Kansas City since 1929 but the company continued to use coal fired steam engines on the northern district until a coal strike created a fuel crisis making it necessary to divert some oil fired engines to the north." My question was, when did the Rock Island complete the transition from hand fired steam engines to oil burning steam engines in the territory south of Kansas City. A. Well, they started converting in 1925 and the territory on which I was employed that

was the last part to be converted. That was converted in the late '20's.

Q. All of the territory south of Kansas City was converted to oil burning steam locomotives by the late '20's? A. As far as I have knowledge of.

Q. And Arkansas is in the territory south of Kansas City, is it not? A. Yes, it is.

Q. Mr. Rich, on page 7 of your statement, the second paragraph from the bottom, about the middle of that paragraph, you state "that I know from experience that a change in geography does not change the duties of a fireman on any type of locomotive and the same is true with respect to brakemen." Does the curvature of the track and grade in which the track is located not have anything to do at all with the duties of the fireman or the brakemen? A. Not with relation to other points on the road, no.

Q. They are no different on curves or on grades than they are on other parts of the railroad? A. No.

Q. What is the duty of the head brakeman when a train is on a curve, Mr. Rich? A. They keep a lookout forward and occasionally look to the rear to inspect the train.

Q. Mr. Rich, isn't it the primary duty of the head brakeman to observe his train when the train is on a curve? A. That's one of them.

Q. Isn't that his primary duty? A. Not necessarily his primary duty, no.

Q. Do you know whether the duties prescribed for your head brakemen are different from the duties prescribed for head brakemen on other railroads? A. No, they are no different except as prescribed by the rules or special instructions on the division.

Q. Mr. Richard, on page 9 of your statement, am I reading the last paragraph correctly to mean that in your opinion the fireman on a hand fired coal burning engine devoted a total of about 65 per cent to firing the engine and his other duties other than lookout? A. You said the last paragraph?

Q. Yes, sir, on page 9. A. I don't see that in the statement.

Q. Does the last paragraph on your page 9 begin with "during the course of these trips——"? A. I said more than half of his time.

Q. Well, you say the fireman devoted more than half his time shoveling coal into the firebox and another 15 per cent of his time was regulating the flow of water into the boiler and checking gauges, lubricators, shaking grates and so forth". What percentage of the time then would be left to perform the lookout function on the hand fired steam engine? A. Less than 35 per cent I would say.

Q. On the stoker, the mechanical stoker fired steam engine and the oil fired steam engine, the fireman would be available substantially more time to perform the lookout function than he was on the hand fired steam engine, would he not? A. That would be correct.

Q. At times when the fireman was available to perform the lookout function on steam locomotives, from what place on the engine would he perform that lookout function? A. From the seat behind the head-brakeman.

Q. On page 11 of your statement, beginning nine lines from the bottom of the page "these conditions required continued presence of the fireman on the deck of the locomotive during the entire assignment or from one end of the road to the other". A. Yes, that is in special conditions.

Q. This is just special conditions, but not all conditions, is that right? A. Ahead of that I enumerated conditions that did sometimes exist and this required the fireman to be in the deck more than he would under favorable conditions.

Q. But there were conditions in which he would spend more time on the deck and other conditions in which he would spend more time in the cab of the locomotive in his lookout position? A. Conditions varied.

Q. How long were you a fireman on a steam locomotive, Mr. Rich? A. Starting in 1922, with the exception of periods of furlough, I was a fireman or engineer on steam locomotives until 1942. We did have a few diesels at that time.

Q. I take it that during this time you were operating as a fireman on a steam locomotive that you learned to shade the fire with the shovel when you were performing on a hand fired steam locomotive? A. There was one word I didn't understand. I learned to do what with the shovel?

Q. Shade your eyes from the fire when you were shoveling coal into the firebox. A. I learned to use the scoop as a guard, yes.

Q. This was to keep the brightness of the fire from blinding you, wasn't it? A. That is correct, yes.

Q. Mr. Rich, on the mechanical stoker fired steam engines and the oil burning steam engines, the valves which the firemen had to operate and gauges which the firemen operated, were located in the cab of the locomotive were they not? A. Yes.

Q. Within easy reach and sight of the fireman's position in the cab of the locomotive? A. Yes.

Q. Is the head brakeman required by company rule to ride in the lead cab or the cab of the lead locomotive on a train? A. The lead unit, yes.

Q. How long has he been required to do so by company rule? A. A number of years. I don't recall when it was inaugurated.

Q. Less than five years? A. I wouldn't think so.

Q. Mr. Rich, the last sentence on page 19 and on the top of page 20, on what type of diesel locomotive is the fireman's seat located behind the seat of the head brakeman? A. Our road switcher types.

Q. And what type locomotives are those? A. You mean——

Q. What model? A. You mean the builders?

Q. And the model number. A. Alco RS 3's and the GP 7's, 9's and 18's.

Q. On those locomotives, the head brakeman's seat is between the seat of the fireman and the front window of the cab of that locomotive? A. Yes. They exchange seats, but that is the assigned seat.

Q. Does the builder of these locomotives designate these seats as firemans' seat and head brakeman's seat? A. No.

Q. They are just seats there which can either be occupied by a fireman or the head brakeman? A. That's right.

Q. Mr. Rich, what was the dimensions of the front windows on the steam locomotives? A. We had three sections in those windows. One section would be approximately eight inches wide at the bottom and possibly ten inches wide at the top of that section which was just below an adjustable window that was roughly six by eight inches square that we used for a ventilator or to look through in bad weather and so forth. The other one was roughly from ten inches at the bottom to probably twelve inches at the top. The entire visibility through the window would extend possibly 30 to 36 inches in length.

Q. At the bottom of page 20 you refer to diesel locomotives in which the crewmen look out from the cab through broad panels of safety glass with little or no obstruction of their view. What model of diesel locomotives are you referring to here, Mr. Rich? A. GP 7's, RS 3's and other types of locomotives that we have.

Q. Are you saying that all of your locomotives which the Rock Island operates in Arkansas has broad panels of safety glass with little or no obstruction of their view? A. They all have better view than the steam engines had, yes, sir.

Q. That wasn't my question, Mr. Rich. I am asking you if you are stating that all of the diesel locomotives operated by the Rock Island in Arkansas have broad panels of safety glass with little or no obstruction of their view? A. Yes.

Q. Do these broad panels of safety glass as you term them extend all the way across the front of the cab of these locomotives? A. Not in every case, no.

Q. In those cases when they do not, the view would be more obstructed than when they did, is that right? A. If you were looking out—yes—from the top of the cab.

Q. Are telephones located at each of every siding that your railroad has in Arkansas? A. Each end of every siding in automatic block signal territory. At other stations, there is only one telephone.

Q. There would be at least one telephone at each siding? A. As far as I know, yes, sir, not on the south end.

Q. Not on the south end? A. I would qualify that between here and El Dorado. There isn't a telephone at each and every siding.

Q. Then that part of your statement on page 22 at the top of the page referring to the head brakeman I believe you said "he knows the characteristics of the railroad and can summon help if necessary either by using the radio or by use of one of the telephones which are installed at every siding." This portion of your statement is incorrect then? A. It could be at some particular statement. I was trying to recall if we had one that did not have a telephone.

Q. I understood you to say that on the south end, that is, from Little Rock to El Dorado, you did not have telephones at every siding. A. That is the only possibility.

Q. Do you know how many sid[illegible] the Rock Island has in Arkansas? A. I would h[illegible] count those on a timetable.

Q. Mr. Rich, where are the repair facilities for engines operated in Arkansas located? A. Our Biddle Shops.

Q. And what type engines are those shops equipped to repair? A. We do not do heavy repair on any type engine. We do running repairs on the Alco road switchers, the GP 7's, 9's and 18's and the thousand horse power Alco yard engine.

Q. What type repair facilities are located at, is it El Reno, Oklahoma? Is that the name of the town? Do we have repairs at El Reno? A. I was going to answer that. We do have repair facilities at El Reno.

Q. And what type repairs are done there? Are these light repairs also? A. But we do heavy work.

Q. Heavier than Little Rock? A. Yes. I have an engine over there for the installation of a new engine now.

Q. And what type locomotive is the facility at El Reno equipped to handle? A. I would answer that, I am not fully acquainted now as they are extending the shops.

Q. Prior to—— A. But they can make heavy repairs to the Alco road switchers, the GP 7's, 9's and 18's.

Q. Mr. Rich, at the top of page 26 in your statement you say that "on early model diesel locomotives, the low oil pressure device merely reduces the engine to idling speed and it was up to the fireman or engineer to decide whether the engine should be shut down." Are you referring here to the Alco road switchers? A. No.

Q. What type locomotives are you referring to? A. The General Motors type E 3's and 5's, 6's and 7's also.

Q. Does Rock Island operate any of this type locomotive in Arkansas at the present time? A. Occasionally, but they have been modified now. They now have the type governor that will kill the engine in case of low oil pressure.

Q. Mr. Rich, several places in your statement you refer to the engineer or any member of the engine crew. Who makes up the engine crew? What does the engine crew consist of, what people? A. Could you point out a place I used that term?

Q. Page 26, second paragraph, five lines from the bottom of that paragraph. A. I had in mind engineer and fireman at that time.

Q. As a matter of fact, the engineer and fireman make up the entire engine crew, isn't that right? A. As it stands now, yes.

Q. Your statement could just as well have said the engineer or fireman can check the cooling water level and add water if needed, and so forth? A. I could have said the engineer, yes.

Q. You could have said the fireman too? A. Very well so, yes.

Q. Mr. Rich, on page 27 of your statement, the second full paragraph you refer to hooded locomotives. These at the GP or general purpose type locomotives as opposed to the car body types? A. Yes.

Q. And you refer to hooded locomotives which have no walkways between units. Does Rock Island have any of this type engine operating in Arkansas which has no walkways between their units? A. Yes.

Q. When were those walkways removed? A. They never were applied.

Q. Are the Alco switch engines of the general purpose type? A. Yes, they are referred to as road switcher which means they can be used in road service or switch service either.

Q. They are hooded locomotives? A. Yes.

Q. Do all of your hooded locomotives other than the Alco switch engines which you refer to have walkways between units? A. Let's correct your statement.

Q. Pardon? A. I said let's correct your statement except the road switchers.

Q. Not just Alco road switchers but all your road switchers, is that right? Tell me which locomotives do. A. Okay, to keep it all on record, I will enumerate the engines that do not have and with that exception the rest

do have. We have six Alco road switchers that do not have walkways between the units. We have five engines that formerly were Alco road switchers that has had an end engine applied and that makes 11 total road switchers that do not have walkways.

Q. The remainder of your hooded locomotives do have the walkways? A. Yes, sir.

Q. And on those locomotives there is no prohibition of the fireman or any other member of the crew walking between those locomotives while the train is in motion? A. No, there is no specific instruction. We recommend that the train be moving very slowly when they do that.

Q. Mr. Rich, the motor cars which you refer to in your statement usually were operated as single units, were they not? A. In a few instances they were and several instances we pulled a passenger car trailer behind it.

Q. In some instances there would be two cars making up this train? A. Yes.

Q. So-to-speak? A. Yes.

Q. Would two be the maximum number that made up one of these trains? A. We operated one that was a locomotive unit which pulled two trailers between Little Rock and Hot Springs.

Q. Which pulled two cars? A. Yes.

Q. So there would be no instance in which there would be more than three that were hooked together to make up the train would there that you are aware of? A. In passenger service, not that I am aware of.

Q. How many trains do you ride per month, Mr. Rich, if any? A. That varies from none to as many as six or eight.

Q. At page 30 of your statement you referred to, at the the bottom of the page, the operation of the train between Alexander and Eunice, Louisiana, daily with an engineer, conductor and one brakeman and you state "we have never in that time——". That you have done this since

1964 and you state "we have never at that time had an occasion when a fireman or second brakeman was needed". How many of those runs have you ridden on since 1964, Mr. Rich? A. I'd say I have ridden that train a couple of times?

Q. For a couple of times? A. Yes, over some portion of the road.

Q. So your personal knowledge of the operation of that train would be limited to those few times on which you rode it? A. From an observation standpoint, I'd say yes, but as an officer who is in touch with the operation of the division, I would have knowledge of it.

Q. Mr. Rich, is there anything in the rules of your railroad or the rules of the Federal Communications Commission which allows switching movements to be signalled by radio communication? A. Yes.

Q. What is that rule? A. Your operating rules provide that radio communications may be used in connection with movements made under Rule 12 and certain other things.

Q. Does Rule 12 provide for hand signals in switching movements? A. It does with the exception that radio may be used in lieu of hand signals.

Q. Mr. Rich, are you familiar with the rules in the book that the Rock Island puts out, "Rules and Instructions Governing the Operation of Railroad Radio Communication System" effective August 1, 1956? A. Yes, I have a copy of that.

Q. Is this the latest edition of this set of rules? A. Radio rules, yes.

Q. The 1956 edition? A. Yes.

Q. Mr. Rich, I am going to give you this booklet and if you would, refer to page 3, rule 1 which extends on over on to page 4, and, if you would, tell me what portion of this rule allows switching movements to be signalled by radio communication signal, radio commissions. A.

I told you that the operating rules provided that radio could be used.

Q. And you referred to Rule 12 of the Operating Rules? A. I said the operating rules provided that radios could be used in lieu of hand signals as provided by Rule 12.

Q. What rules then provides that radio communications can be used in lieu of hand signals as described in Rule 12? A. I would have to have the operating rules and all of the amendments to be able to tell you what rule provided for it.

Q. Rule 12 then has been modified by some rule other than the rules contained in the radio communications booklet that I have handed you? A. To that extent, yes, sir.

Q. Would it help you to locate that rule if I would give you this uniform code of operating rules with the revised supplement as of January 1, 1967? A. I think perhaps I could.

(Mr. Ross passed the document just described to the witness.)

Mr. Ross: Note that I have handed Mr. Rich the documents just referred to.

The Witness: Rule 12 LI in the supplement, paragraph 3.

By Mr. Ross: Q. Will you read that? A. It says "When backing or shoving a train, engine or cars, except when movement is controlled by an employee operating a back-up air hose or pipe the disappearance from the view of an employee or light by which the signals are given or a failure to keep in contact by a radio when instructions are being given by radio, must be construed as a stop signal."

(The witness passed the booklets back to Mr. Ross.)

By Mr. Ross: Q. And it is your interpretation of the rule that it allows switching movements to be made by

radio communications rather than hand signals? A. It allows it to be made either by hand signal or radio.

Q. Then the fact that the rules and instructions booklet governing the operation of railroad radio communications equipment does not specifically authorize the use of the radio for this purpose has no bearing at all? A. The radio rules prescribe that radio may be used as a form of communication.

Q. It doesn't mention the switching operations does it, Mr. Rich? A. The radio rules perhaps does not.

Q. Are you familiar with the radio rules? A. Yes.

Q. Radios are not installed on all of the cabooses used by the Rock Island in Arkansas are they? A. All cabooses are not equipped with two way radios so far as I know. All cabooses have a two way radio or what we term a "walkie-talkie".

Q. Are these radios installed in the caboose? A. No, they are portable, can be carried by crew members.

Q. Where are these radios kept? A. While in service on the caboose.

Q. Pardon? A. While in service they are kept on the caboose.

Q. Did you say that the walkie-talkie radios were not two-way radios? A. Not in the sense that the man on a two way could call a walkie-talkie. The conversation has to be originated with the man who has the walkie-talkie. They are commonly called a radio phone.

Q. So the engine crew could not call the crew in the caboose if the caboose was equipped with a walkie-talkie? A. That's correct.

Q. Are the engines used by Rock Island in road service equipped with either a deadman pedal or some other type of automatic train stop device? A. Not in road service, not necessarily.

Q. They are not equipped with any type of automatic train stop device? A. Not one that would stop the train

in case the engineer is incapacitated. I believe that is the idea of your question.

Q. Yes, that is the idea.

* * * * *

By Mr. Lessenberry: Q. Mr. Rich, I believe during the initial part of your cross-examination by Mr. Ross he asked you about the field of vision from the cab on the lead locomotive in hilly or mountainous terrain and I believe that Mr. Ross asked you if one position in the cab would not sometimes afford a better view of the track ahead in such terrain. Did he not ask you these questions? A. I don't recall that question as being correct.

Q. Well, is it not true that if a train is proceeding through a cut on a curve that one position in the cab would afford a greater field of vision ahead than the other seat in the cab? A. It could, yes.

Q. Now, I understand that there are requirements of minimum safety standards by the railroad and the Federal Government. Is that correct? A. There is.

Q. And I believe the railroads themselves have some sort of minimum standard agreement of cars that are interchanged. Is this also correct? A. If you will clarify the question.

Q. Does the railroad association, does the AAR have minimum standards for freight and service cars that are interchanged? A. Yes, sir.

Q. I want to ask you, Mr. Rich, if in your opinion all of the freight service cars on the Rock Island meet minimum safety requirements? A. They don't always or we wouldn't have inspectors to detect the defects.

Q. Are you afforded the budget or the men or the equipment to fully service all of the freight equipment, freight service cars on the Rock Island to your satisfaction? A. On the territory over which I have jurisdiction, yes, sir. Little Rock is the principal point and we have a pretty good force.

Q. Are you familiar with the other railroads and their freight service equipment that operate in Arkansas such as the Missouri Pacific, for instance? A. In general, but not in detail. They use the same rules we use.

Q. In general would you say that the Rock Island freight service cars are in as good a condition as those found on the Missouri Pacific? A. Yes, sir, because they are very similar. All railroads handle cars owned by all railroads.

Q. Mr. Rich, are you familiar with a proposed merger of the Rock Island railroad with other companies now pending before the Interstate Commerce Commission? A. Not any more than what I read in the newspapers.

Q. Have you heard any expression of Chicago, Rock Island and Pacific Railroad management that they are financially unable to keep their traffic equipment up to par? A. Not in the terms in which you say it. We have spent about $150 million dollars buying new equipment.

Q. You need at least twice that much to put your railroad in good shape, don't you? A. I wouldn't be in a position to answer that as to how much money we need. I don't know.

Q. I just asked you if you were aware of the fact that the Rock Island Railroad is in generally poor financial condition. A. I know they are not in as good a financial position as some other railroads.

Q. Isn't there work that you would like to do in keeping up freight cars and other freight service cars that you are unable to do now because of lack of funds? A. Oh, I'd say we could always utilize more money if we had it, but I don't think we are in dire need for it.

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PLAINTIFF'S EXHIBIT NO. 25— Testimony of W. F. Thompson.

My name is W. F. Thompson and my present position with the Chicago, Rock Island and Pacific Railroad Company is that of Assistant General Manager—System headquartered at Kansas City, Kansas. I have served in this capacity since June 1, 1965. Before this, I held positions of Assistant General Manager, Superintendent, Assistant Superintendent, Trainmaster, Terminal Trainmaster and Assistant Trainmaster during the thirteen years of working as an Operating Officer of the Rock Island. Prior to that I worked six years as a Switchman at Fort Worth, Texas.

In my present capacity, I am primarily responsible for all aspects of operation on the system including scheduling, blocking and performance of trains and the movement of traffic both over the road and through terminals. Included in these duties, is a program of revamping terminal facilities on the entire system to effect improved train and yard performance. During the course of duty, I also assist or represent the General Manager—System at meetings, studies or other functions.

The freight, passenger and yard operations of the Rock Island serve 14 states, including the State of Arkansas. Exhibit A is a map of the Rock Island to which I shall refer in subsequent portions of this statement.

The Rock Island was a party to the proceedings which resulted in the Report of the Presidential Railroad Commission, dated February 26, 1962, and the Award of Arbitration Board No. 282, dated November 26, 1963. On May 7, 1964, the Rock Island placed in effect Section II of the Award of Arbitration Board No. 282, relating to the elimination of firemen from freight and yard engines. Pursuant to this section of the Award, the Rock Island has eliminated a large number of firemen assignments in

freight and yard service in states other than Arkansas which do not have crew consist laws.

During the month of June 1966, the Rock Island operated 7,453 freight runs without firemen as compared to 5,992 on which firemen were used. In this same month there were 7,443 yard engines worked without a fireman as compared to 2,599 on which firemen were used. In states other than Arkansas, Firemen are used on veto or non-blankable assignments, and as necessary on other assignments to provide employment on an attrition basis to those firemen protected by the provisions of the Award of Arbitration Board No. 282.

Insofar as Arkansas operations are concerned, the Rock Island complied with the provisions of Section II of the Award of Arbitration Board No. 282 by listing 21 freight and 23 yard crews which in our judgment, do not require the service of a fireman helper. This list, Exhibit B, was served on the local chairman of the Brotherhood of Locomotive Firemen and Enginemen. Subsequently, these local chairmen designated the crews, pursuant to Part B (2) of Section II of the Award of Arbitration Board No. 282, on which firemen must be retained. They took the position, however, that all Arkansas crews were subject to veto because of the Arkansas statute. Consequently, we designated the veto jobs, as permitted by the provisions of the Award. The correspondence relating to this subject is reproduced as Exhibit C. We have not removed the firemen from the jobs within the State of Arkansas not designated by the local chairmen because of the provisions of the Arkansas statute regarding the use of firemen in freight and yard service.

The Rock Island also utilized the provisions of Section III of the Award of Arbitration Board No. 282 relating to the consist of train crews in road and yard service. The procedures specified by Section III of the Award resulted in the establishment of two Special Boards of Ad-

justment on the Rock Island, on which I sat as the Carrier representative. The awards rendered by these two Special Boards are reproduced as Exhibits D and E to this statement.

Both awards describe in detail the events which led up to the proceedings before the Special Boards. I shall, therefore, omit any discussion of those circumstances. There are certain other aspects of the awards, however, which I should like to call to the Court's attention.

The first Special Board, with Mr. Donald F. McMahon as Chairman, ruled that the proposal of the Carrier to reduce the crew consist of switching and yard crews, from a foreman and two helpers to a foreman and one helper on seventy-three crews, was justified by reference to the guidelines specified in the Award of Arbitration Board No. 282, including the safety guideline emphasized by the Board.

The second Special Board of Adjustment on the Rock Island authorized reductions in 72 crews from a foreman and two helpers to a foreman and one helper. This included eight crews on the Arkansas Division.

The two jobs listed at El Dorado, Arkansas, perform all types of switching; interchange, lead and industrial being the three major kinds of switching. These jobs switch and make up the through freights and locals arriving or originating at this point, handle all industrial work and interchange cars to and from the Missouri Pacific and El Dorado and Wesson railroads.

The 7:45 a. m. west lead job at Biddle, Arkansas, also included in the Award, is principally an industrial job with some lead switching involved. The five jobs at Little Rock covered by the Award perform principally industrial switching, with a lesser amount of interchange and lead switching.

The two jobs at El Dorado are the only ones working at that location. At Little Rock, Arkansas we have seven

yard crews which are not covered by the Award of the Special Board, in addition to the five that were covered by the Board's Award. These jobs are presently manned by crews consisting of a foreman and three helpers because of the requirements of the Arkansas statute. Our Collective Bargaining Agreement with the Switchmen's Union of North America requires a minimum crew of a foreman and two helpers. Since the authority of the Special Board was limited to reducing the consist of crews required by agreements, practices and so forth, the question, presented at the time that we sought reductions in the size of yard crews from the Second Special Board of Adjustment, was whether or not we would seek authority to reduce these seven crews below the minimum of one foreman and two helpers required by our agreement. It was the judgment of the division officers that a consist of a foreman and two helpers for these seven crews would be desirable and accordingly we did not list these seven crews in the proceedings which resulted in the Award of the Second Board. In the absence of the Arkansas statute, however, we would operate these crews with a foreman and two helpers instead of the foreman and three helpers now required by the Arkansas statute.

As a consequence of these Awards by the two Special Boards of Adjustment, we have reduced the size of 137 crews from a foreman and two helpers to a foreman and one helper. We have been unable to accomplish the authorized reduction on eight crews because of the Arkansas statute requiring a foreman and three helpers.

The situation on the Rock Island with respect to the size of crews in freight and yard service is presently a result of the Award of Arbitration Board No. 282 insofar as firemen are concerned, the Awards of the Special Boards to which I have referred insofar as yard ground crews are concerned, and the requirements of the Arkansas statutes insofar as freight and yard crews in Arkansas

are concerned. In addition to the requirement that firemen be used on certain freight trains and in yard service in Arkansas and that three helpers be used on certain switching crews in yard service, we are required to use three brakemen in freight service where the length of the train is in excess of 25 cars. As of June 1966, the Rock Island had a daily average of 34 crews in freight service on which we were using three brakemen as a result of the requirement of the Arkansas statutes. In states other than Arkansas our train crews in freight service consist of a conductor and two brakemen on all through freight trains. On 15 locals operating outside of the State of Arkansas we operate with a train crew consisting of a conductor and one brakeman.

The reduced crew on the above-mentioned locals is a result of an agreement with the Brotherhood of Railroad Trainmen which is Exhibit F.

On our through freights operating within the boundaries of Arkansas we are compelled to employ a conductor and three brakemen. As an example, freight trains Nos. 26 and 32 operate between Tucumcari, New Mexico, and Memphis, Tennessee. The train crews consist of a conductor and two brakemen from Tucumcari to Hartshorne, Oklahoma, the first terminal outside the State of Arkansas. On leaving Hartshorne the crew consists of a conductor and three brakemen and this crew consist prevails until the trains reach Memphis. On westbound trains operating between Memphis and Tucumcari a conductor and three brakemen are employed through the State of Arkansas and until reaching the first terminal west of the Arkansas line and the crew consist then changes to a conductor and two brakemen. The consist of the trains as to the number of cars does not change.

On our North-South line, which extends from Little Rock to Alexandria, Louisiana, a conductor and three brakemen are employed on the trains from Little Rock

to El Dorado and to the Arkansas-Louisiana line. Through the State of Louisiana the crew consists of only a conductor and two brakemen. The third brakeman is a member of the crew from El Dorado to Ruston, Louisiana, a distance of approximately fifty miles. The remainder of the run from Ruston to Alexandria is made with only two brakemen. On North bound movements, the procedure is reversed, the third brakeman getting on at Ruston for the remainder of the run to El Dorado.

We were authorized under the two special boards to reduce 145 switch engines. Eight of these engines were located within the State of Arkansas. With the exception of these eight crews the remaining 137 jobs which are still in existence are generally worked with a foreman and one helper. The remaining switch engines on our system, with the exception of those in Arkansas, are manned by a foreman and two helpers. In the State of Arkansas all of our switch engines except one are manned by a foreman and three helpers. This job does not switch over public crossings and consequently is manned by a foreman and two helpers.

These differences between the size of crews used in freight and yard service in Arkansas and in other states through which the Rock Island operates are not justified by any significant differences in the kinds of freight and yard operations conducted in the various states, or the physical and geographical circumstances under which the operations are conducted.

The nature of the terrain through which the Rock Island operates in Arkansas is not dissimilar from that of neighboring states considering operating characteristics such as grades, curves, grade crossings and signal protection. The maximum ruling grades in the State of Arkansas are of one percent elevation with the exception of a very few ranging up to 1.103 percent. This is comparable to the terrain in the states of Louisiana, Oklahoma, Missouri,

Kansas and Texas where maximum ruling grades are also one percent, but in a few instances range upward to 1.22 percent, and on one location, namely: Sanford, Texas, reaches 3.30 percent.

Exhibit G hereto, is a signal map showing Automatic Block Signal, C. T. C. and train order operation territories of the entire Rock Island System. The greater portion of the Arkansas operation on the single track main line between Memphis Tennessee, and Tucumcari, New Mexico, namely: that section between West Memphis, Arkansas, and Perry, Arkansas, is governed by both train orders and automatic block signals. From Perry, Arkansas, to the Oklahoma State Line, trains operate on train orders; however, this is also true of the balance of this single track main line to Tucumcari, New Mexico, with the exception of that portion between Oklahoma City and El Reno, Oklahoma, which is controlled by automatic block signalling.

With respect to length of trains and density of traffic, freight operations over the Rock Island lines in Arkansas are smaller in volume than freight operations on other parts of the Rock Island System. Exhibit H, which is a tonnage density chart, clearly indicates the density of traffic on other segments of the Rock Island System far exceeds that within the State of Arkansas.

The length of freight trains operated within the State of Arkansas is essentially no different from that in other states in which the Rock Island operates. As an example, on three typical representative dates of March 9, 10, and 11, there were twelve freight trains operated between Memphis, Tennessee, and Little Rock, Arkansas, with an average consist of 62 cars and on each of these trains, three brakemen were used.

On these same dates, 31 trains were operated between Kansas City, Missouri, and Herington, Kansas, with an average consist of 78 cars and here only two brakemen were used.

With respect to yard operations, the crews in Arkansas on which we are required to use three helpers perform service which is essentially similar in all major respects to the service performed by crews consisting of a foreman and one helper or a foreman and two helpers in states other than Arkansas.

As an example, the two switch engines at El Dorado, Arkansas, which were authorized under the Witney Award to be reduced to a foreman and one helper are involved in all types of switch moves. Switchmen are required to set hand brakes, and to switch over a number of street crossings. The crews on these jobs presently consist of a foreman and three helpers. They are doing work identical to that performed by a foreman and one man crew in other states. As a comparison, the crew in the Sylvania Yard at Fort Worth, Texas, which consists of a foreman and one helper, is required to maintain hand brakes on the cars as they are switched into the track, they switch over First Street crossing, which is a heavily traveled crossing, and they are required to do more industrial switching than either of the jobs at El Dorado, Arkansas.

The fact that operations in yard service are as safe with a crew consisting of a foreman and one helper as they are with a crew consisting of a foreman and three helpers is indicated by the findings of the second Special Board of Adjustment on the Rock Island. Dr. Fred Witney, Chairman and neutral member of the second Special Board, stated his findings in that regard as follows:

> "What is most significant for purposes of this case is that there is no evidence whatsoever that the two man crews operated their jobs except in a safe manner. As testified to by both Carrier and Union witnesses, there is no evidence that switchmen have been killed or injured; there is no evidence that other employees of the Carrier have been killed or injured; there is no evidence that there have been injuries to

pedestrians or to passengers in vehicles which cross the Carrier's tracks; and, there is no evidence that employees of industries switched by the two man crews have been killed or injured."

Comparability of freight and yard operations on the Rock Island in Arkansas and in other states is also indicated by the use of radio throughout the Rock Island System.

All serviceable freight and yard locomotives on this property are radio equipped. The Rock Island has 111 wayside radio stations spaced for maximum operation convenience in the 14 states in which we operate. The manner in which radio is used in freight and yard service is described by Mr. Troth in his statement.

At the present time we are equipping our maintenance of way forces with radios to provide additional safety to them and the equipment when they are working on the track structures. The use of these radios, coupled with the operating provisions set forth in the rules, contributes to safety of operations. At the present time we are also equipping our car inspectors in major terminals with 2-way radio sets to place them in more constant communication with the yard supervisors and at the same time afford added safety protection.

[Exhibits to Testimony Omitted from Appendix.]

INTERVENORS' REBUTTAL EXHIBIT NO. 25—

Cross-Examination,

By Mr. Ross:

Q. State your name and address, please, sir? A. W. F. Thompson, 624 Scott, Kansas City, Kansas.

Q. In your present position as assistant general manager, you work, I assume, under the vice president in charge of personnel? A. Directly under the general manager and the vice president of operations.

Q. Did you regularly represent Chicago, Rock Island before Special Boards which were convened under Arbitration Board 282 Award? A. There was two Special Boards on the Rock Island dealing with the switchman's issue and I was the carrier representative on both of the Boards.

Q. Mr. Thompson, I believe you were a member of the Special Board convened under Board 282 Award for the purpose of determining train crew consist on a number of operations of the Chicago, Rock Island. The award was dated November 20, 1965, is that correct? A. Not dealing with train crews, with switch crews.

Q. Switch crews I meant. Was this Board made aware at the time that any decision made by it would not be applicable to switch jobs in the State of Arkansas? A. We were working under the provisions of Award 282 and listed I believe there were eight jobs within the State of Arkansas but they were not reduced due to the State statutes.

* * * *

Q. Was the Board made aware at the time that it was convened and during its procedure that its award would not be applicable to the jobs in Arkansas? A. The Board was aware of the Arkansas statutes; however, the jobs in Arkansas were listed and the Board rendered the fact that the eight listed jobs could be worked with a foreman and a helper.

Q. Mr. Thompson, are you familiar with the accident experience of your railroad over the last four or five years? A. Yes, I have a general familiarity with it as it relates to my position.

Q. Do you know whether or not accidents in general have increased or decreased? A. Do you have reference to crossing accidents or personal injury accidents?

Q. Train accidents? A. From my own observation, I would say there has been no appreciable increase for the number of trains which are being operated now.

Q. Has there been an increase or decrease in the number of accidents on your railroad outside Arkansas in the last four years? A. Again referring to my own personal knowledge, I would say that related to the number of trains now being operated that it is similar to what it was some three or four years ago:

* * * *

By Mr. Lessenberry: Q. Mr. Thompson, did I understand your testimony to state that there were two Special Boards of Adjustment that were convened to consider particular yards in Arkansas in regard to the switchmen jobs? A. There were two Special Boards convened on the Rock Island to consider the total system yards not limited entirely to the State of Arkansas.

Q. And in the report or the award of the Board, there was no reference to any particular yards in Arkansas, was there? A. Yes. In the second award before Mr. Whitney, the itemized yards before the Board included switch engines at El Dorado, Arkansas——

Q. Excuse me, Mr. Thompson, are those the ones you are going to read listed as Appendix A, Page 5 to your testimony? A. Yes, sir.

* * * *

Q. Now, with reference to the first page of your exhibit, Mr. Thompson, you describe your obligation and responsibility of your position to the performance of trains and movement of traffic over the road and through the terminals. You then conclude that it is part of your duties the revamping program of terminal facilities. Is this correct? A. Yes.

Q. Would you describe your revamping program as aggressive or adequate? A. I would say it's aggressive.

Q. Are you aware, Mr. Thompson, of an application approved by the stockholders of the Chicago, Rock Island and Pacific Railroad to merge this line with other railroad companies? A. Yes.

Q. And I'll ask you if you have any knowledge that at least part of the public interest is prompted because of a lack of finances to conduct revamping programs and to bring your rolling stock up to par with your competitors? A. I understand that is the position.

Q. Can you give us the benefit of the apparent conflict between the position of railroad management before the Interstate Commerce Commission and your statement filed in this lawsuit? A. We are attempting to upgrade our terminals to the extent which we can. At the particular yard in Little Rock, we have recently upgraded our yard facilities by the retirement of some tracks in the yard providing track centers and installing a mechanized upgrading program for the upgrading of equipment to better suit the shipper's needs. This same program has been carried out through additional terminals on our property.

Q. Isn't it true, Mr. Thompson, that your railroad is having a difficult time maintaining its rolling stock to comply with the minimum safety standards? A. Not necessarily. Our bad order ratio in the past year has been reduced from in excess of nine percent to approximately 2.5 percent which I think is indicative of the advancements being made in this area.

Q. And these are prompted at least to a certain extent by the demands of the purchasing railroads that the Rock Island do this and I am referring to your applications again on the finance docket? A. To my knowledge they have nothing to do with this repair program to our equipment.

Q. Mr. Thompson, aren't you sacrificing service to the shipping public at the time you are abandoning these certain tracks and other facilities that you have mentioned?

Mr. Light: I object on the ground that that question is wholly irrelevant and immaterial to any issue to this

lawsuit. If you know the answer, Mr. Thompson, you may answer over the objection I have made.

The Witness: The answer is to the contrary. We are actually improving our service by the abandonment of these tracks.

By Mr. Lessenberry: Q. On the Special Board, excuse me, the two Special Boards on which you participated, was there any representative of the State Government represented? A. No. The Board consisted of a representative from the switchman's organization, a neutral which was appointed and myself.

Q. And do I understand that this Board either jointly or individually visited these several yards for this study in making this award? A. Yes. The Board in its entirety visited both El Dorado and the yards at Little Rock and observed the switching functions performed by the switch engines involved in this issue.

* * * *

Redirect Examination,

By Mr. Light:

Q. Mr. Thompson, I direct your attention to the quoted material at the top of Page 11 of your testimony and I understand you to identify that as an excerpt from the opinion and award of the neutral member of the Board of which you were a member. Is that correct?

Mr. Ross: I object to this on the grounds that it is not proper redirect as it was not covered on cross-examination.

By Mr. Light: Q. Have I correctly identified what this excerpt is? A. Yes.

Q. Mr. Ross inquired of you during cross-examination about the accident incidents or history on your railroad the last, I believe he said, five years. Do you recall that? A. Yes.

Q. Does this excerpt on Page 11 have any reference to that subject? A. Yes, as it relates to injuries involving switch crews and switch engines.

Q. What evidence does your Board have before it or rather relating to the subject matter that the neutral member discusses in this excerpt on page 11?

Mr. Lessenberry: I am going to object to that and state the best evidence as to what was before the Board would be the record of the Board.

Mr. Ross: I join in the objection.

Mr. Light: Go ahead, Mr. Thompson.

The Witness: One of the guidelines under the provisions of Award 282 is safety. We had a previous award on the Rock Island and was working approximately seventy-two engines with a foreman and one helper. For presentation to the second Board, we made an exhaustive study of injuries involving switch crews. We found there had been no personal injuries sustained by a member of a two man crew while during the same period there had been personal injuries to three man crews.

Mr. Lessenbery: Now, I want to object to conclusions as the witness relates them as to findings of the Board unless those findings of the Board are made a part of this record and he can identify them as such and further that those findings be complete and not simply excerpts.

Mr. Ross: I join in the objection.

By Mr. Light: Q. You have stated that this survey or study extended to or covered two man switch crews and three man switch crews? A. That is correct.

Q. Did it also include any of the four man switch crews in Arkansas? A. Yes, it covered the entire system.

Q. Do you recall about what period of time was examined. Let me restate the question. The study was of switching operations over what period of time? A. It was from time to time the first award had been placed into effect which was in the latter part of September,

1964 until the approximate, until approximately November of 1965.

Q. That is a period of about how many months? A. Thirteen months.

Q. Mr. Lessenberry inquired about your program for terminal improvements and equipment improvements. Would it be of any assistance to you if those program, if you were free to operate under the award?

Mr. Ross: I object to that question it being a leading question.

Mr. Light: How about letting me finish the question?

Mr. Ross: I wanted to suggest it before you suggested the answer that you wanted to obtain from the witness.

Mr. Light: Would you wait, Mr. Thompson, to answer the question until Mr. Ross has made his objection if he will show me the courtesy of allowing me to complete the question.

Q. What effect would it have on your ability to carry out these improvement programs in connection with terminal facilities and equipment if you were free to operate in Arkansas under the award of Board 282 and of the Special Boards of Adjustment convened thereunder?

Mr. Ross: I object to the question on the ground that it is a leading question particularly as originally phrased and suggested the answer which Mr. Light wishes to receive from this witness and further move that the question and any answer Mr. Thompson may give be stricken from the record.

Mr. Lessenberry: I join.

* * * *

The Witness: Like any business or industry our capital improvements are budgeted as to the money available to make such improvements. If we were allowed to operate in Arkansas as in other States, this, of course, would be most beneficial from a monetary standpoint and would provide more capital for us to continue the upgrading of our property.

Mr. Ross: I further object on the grounds that this is a conclusion of this witness and not a recitation of any facts that the witness is aware of.

By Mr. Light: Q. Mr. Thompson, referring again to the survey or study that was presented to the Board of which you were a member, did you happen to also participate in making and preparing that study? A. It was made under my direction and at my request.

Q. Is the result of the study that you have described during your testimony today based upon your personal knowledge then? A. Based upon my personal knowledge and the facts that were presented to this Board, this Special Board.

Mr. Ross: I object on the ground that this is a leading question and suggested the answer that Mr. Light wished to obtain from this witness.

Mr. Light: I believe that is all.

Recross-Examination,

By Mr. Ross:

Q. Mr. Thompson, are accidents costly to the railroad, to your railroad? A. Yes.

* * * *

By Mr. Lessenberry: Q. I take it from your response to Mr. Light's question that the Rock Island Railroad does not have sufficient funds to maintain its property at a standard that it would like to? A. I think all railroads would like to increase their standards as to the maintenance of their property and improvements on their property.

Q. Then, can I gain from that there are certain areas of your property that are below the standard that you would like to see them? A. Yes, that's true.

* * * *

PLAINTIFFS' EXHIBIT NO. 26—**Testimony of E. C. Meinholtz.**

My name is E. C. Meinholtz. I am presently employed as Mechanical Engineer of the Missouri Pacific Railroad Company and subsidiaries, including the Texas & Pacific Railway Company; Missouri-Illinois Railroad Company; Kansas, Oklahoma & Gulf Railway and American Refrigerator Transit Company. My primary duties and responsibilities as Mechanical Engineer center about the design and construction of freight and passenger train cars. Details of construction as pertain to strength and durability of principal components of rebuilt and modified as well as new cars built by the railroad or purchased from outside concerns, are passed upon and approved by me.

Prior to my appointment as Mechanical Engineer, I was employed in the test and experimental department of the Missouri Pacific Railroad Company and was engaged largely in testing and experimental work to demonstrate the durability and efficiency of car and locomotive components as well as road and service testing of complete locomotives and cars. In connection with these duties, it may be added that during 1929, I spent over three months in dynamometer car tests over the entire system to establish freight train tonnage ratings, during the course of which tests ample opportunity was afforded to observe the many types of freight train cars in use during that period and to become acquainted first-hand with difficulties in railway operation brought about by the deficiencies in the design and construction of such cars. In addition to duties associated directly with the Missouri Pacific Railroad and subsidiaries, I am currently a member of the Committee on Freight and Passenger Car Construction of the Association of American Railroads and a past member of the Committee on Lubrication of Cars and Locomotives of that Association. I am also Chairman

of the Mechanical Advisory Committee of the Trailer Train Company, a freight car rental organization owning upwards of 30,000 cars used primarily in piggy-back and auto transport service.

I am a graduate Mechanical Engineer, having received a B. S. degree in 1925 and a M. S. degree in 1926 from Washington University, St. Louis, Missouri.

Exhibit 1-A submitted with this statement shows the freight car ownership of the Missouri Pacific Lines (including Missouri-Illinois, Gulf Coast Lines and International-Great Northern) and the Texas & Pacific in 1929, segregated into principal car types and further subdivided into groups by nominal car capacities. In the same exhibit and in the same tabulation, I have, for easy reference, shown the June 30, 1966 ownership of the present Missouri Pacific and subsidiaries (Missouri-Illinois; Texas & Pacific; Kansas, Oklahoma & Gulf and cars leased to the Missouri Pacific by the American Refrigerator Transit Company, a partially-owned subsidiary). The 1966 ownership figures have been further subdivided into certain specialized types of box, gondola, covered hopper. and other equipment not developed or considered necessary in the 1920s but now required to meet the demands of certain shippers

Exhibit 1-B is an amplification of Exhibit 1-A and shows the trend towards freight cars of higher weight as well as volume capacity. Examination of the tabulation shows that the average weight capacity per car has increased from 40.9 tons in 1929 to 61.9 tons at the present time, an increase of somewhat over 51%. The effect of the higher car capacity is well demonstrated by the fact that the aggregate weight capacity of the entire Missouri Pacific fleet was increased from 2,612,096 tons in 1929 to 2,908,085 tons in 1966 in spite of the decrease in total car ownership from 63,834 to 46,991.

Higher car capacity naturally results in a lesser number of cars required to handle a given tonnage and it is

logical to conclude that due to the reduced number of expendable and trouble-producing components in a train of high capacity cars (wheels, axles, bearings, couplers, etc.), less trouble will be encountered on line of road.

To illustrate changes in freight car construction and the trend towards cars of higher capacity, I have included in Exhibits 2 through 16 photographs of typical cars in service during the 1920s and modern cars acquired to meet current demands.

> **Exhibit 2** portrays a 25-Ton capacity wooden underframe box car, originally built in 1907 but completely rebuilt in 1924. In addition to relatively weak wooden underframe construction, this series of car was equipped with arch bar type trucks, the characteristics of which will be described later.
>
> **Exhibit 3** shows a 36-foot, 40-Ton capacity box car employing a steel underframe with wooden superstructure type of construction. This car, like that shown in Exhibit 2, was also equipped with arch bar type trucks.
>
> **Exhibit 4** shows a single-sheath type of box car representative of the most advanced type of construction developed in the 1920s. This car is essentially a steel car and wood sheathing is merely used to contain the lading and is not essential for the mechanical strength of the assembly. Cast steel truck sides are used on this car but it is equipped with chilled or cast iron wheels in common with the car shown in Exhibits 2 and 3 as well as Exhibits 5 and 6 to follow.
>
> **Exhibit 5** shows a drop bottom type gondola car built in 1917. This car is similar in construction to the box car shown in Exhibit 4 in that wood is employed for the containment of the load only but it is dissimilar in regard to the type of truck which, it will be noted, is of the old arch bar construction.

Exhibit 6 shows a composite type gondola built in 1928 with a capacity of 50 tons. This car is of wood and steel construction and is equipped with one of the earlier types of cast steel truck side frame of the modified Andrews type employing a steel tie bar.

Exhibits 2 through 6 portray some but not all of the types of cars commonly handled in freight trains in the 1920 period. At that time, all-steel box and gondola cars, owned principally by eastern roads, were being handled on the Missouri Pacific but cars of the general type portrayed in the exhibits were in the majority.

By way of contrast, **Exhibit 7** shows a modern 50-foot, 70-Ton capacity cushion underframe box car equipped with steel wheels and roller bearing trucks. In like manner, **Exhibit 8** shows a modern 60-foot, 100-Ton capacity cushion underframe box car which is likewise equipped with steel wheels and roller bearing trucks.

Exhibit 9 shows a 100-Ton nominal capacity 65-foot all-steel gondola car equipped with drop ends for handling long structural steel shapes, pipe, etc. This car, like other modern cars, is equipped with roller bearing trucks.

Exhibit 10 shows a 100-Ton capacity quadruple hopper car suitable for handling coal, stone and similar bulk commodities. These cars are constructed with corrosion-resistant steel bodies and are equipped with roller bearing trucks.

Exhibit 11 covers a 60-foot general purpose type flat car built with cast steel underframe and equipped with steel wheels and roller bearing trucks.

Exhibit 12 depicts a car having superstructure similar to the car shown in Exhibit 11 but equipped with bulkheads and special tie-down chains designed primarily for the handling of finished lumber. This par-

ticular car is capable of handling a net load slightly less than 90 tons.

Exhibit 13 shows a 125-Ton nominal capacity flat car built primarily for handling heavy machinery and similar materials. This car is equipped with six-wheel trucks and standard solid bearings.

Exhibits 14, 15 and 16 show typical examples of the modern high cubical and weight capacity covered hopper cars. This particular type of car was unknown in the 1920s but today they are being purchased in ever-increasing quantities.

Exhibit 14 shows an all-steel, 100-Ton capacity, 3,960-cubic foot covered hopper car of the cylindrical or center flow type.

Exhibit 15 portrays an all-aluminum 100-Ton 4,000-cubic foot car used primarily for the transportation of edible products and for chemical products having a tendency to corrode ordinary steel.

Exhibit 16 shows an all steel, 4,740-cubic foot covered hopper car suitable for handling grain and other low density products demanding a high cubical capacity. This car, like the other covered hopper cars, is equipped with steel wheels and roller bearings.

The foregoing exhibits show, in a general way, changes which have taken place in freight car construction between the 1920s and 1966. These exhibits cannot show, however, the great advances made in improving the strength and durability of the principal components of the freight train car including more durable steel wheels as compared to the cast iron wheels formerly used, better design of axles to increase durability and reliability, improved bearings to not only prevent delays enroute resulting from hot journals but to greatly reduce the incidence of "burn-offs" usually terminating in derailments and accidents, refined truck assemblies to provide freedom

from failures enroute and better riding qualities with less danger of derailment, greatly improved durability in couplers, yokes and draft gears, the effect of which is a reduction of train accidents from "break-in-twos" enroute, refined air brakes and improvements in brake shoes resulting in greater ease of handling and control of stops by the engineer along with a reduction of undesired emergencies which usually result in "break-in-twos" and possible train accidents, and a general increase in strength and durability in the entire car structure.

In more detail, the principal changes and improvements in the essential components of freight cars in operation during the 1920s as compared to cars currently produced are as follows:

Wheels—During the 1920s, it is estimated that 80 to 85% of the cars in operation on the Missouri Pacific Railroad were equipped with cast iron wheels, the great majority of which were of the original double plate design superseded in 1928 by the more durable single plate wheel. The cast iron or chilled iron wheel presented a hard wearing surface to the rail but unfortunately, the metallurgy of the wheel was such that it was prone to develop surface defects along with occasional complete disintegration in service as the result of heat generated from service braking. Additionally, the chilled iron tread was relatively brittle and flange failures occurred occasionally when passing over frogs and cross-overs, oftentimes with disastrous end results. Wrought or rolled steel wheels were available in the 1920s but were not generally adopted for use on the Missouri Pacific as well as neighboring lines until the late 1930s. Because of the added durability and reliability of the rolled steel wheel including the cast steel wheel which was made available during the early 1950s, the cast iron wheel was largely discontinued and Section W-5 of Association of American Railroads' Interchange Rule 3

prohibits use of this type of wheel on all new cars as built and on existing cars operated in interchange service after January 1, 1968. Because of the acknowledged superiority of the steel wheel, the transition from the cast iron wheel has been exceedingly rapid and as a result, cast iron wheels are rarely seen on cars in operation on red ball freight trains of today. As a consequence, wheel failures and the derailments and emergency stops resulting therefrom have ceased to become a real problem of operation.

Axles—During the 1920s, the standard A. A. R. freight car axle was of the small wheel seat, black collar type and was, with only minor exceptions, machined and placed in service without any form of heat treatment following the forging operation. The standard axle of today is provided with an increased diameter or raised wheel seat to lower the operating stresses and increase durability and freedom from road failures. In addition, the modern axle is invariably control cooled after forging and in many instances, is subjected to special heat treating operation to increase the physical properties with a view of reducing the possibility of service failure. In this connection, all axles used in new and existing cars operated in interchange must conform to Association of American Railroads' Specification M-101-64, which specification requires that axles for 100-Ton capacity cars (or greater) be heat treated by a normalizing and tempering operation.

A further increase in the general quality level of freight train car axles is brought about by the vastly improved techniques and equipment used in the inspection of new axles as well as in axles which are shopped for application of new wheels or reconditioned to correct service wear. Testing of axles for incipient failure by the magnetic particle method is stipulated in Rule 1.17 of the Association of American Railroads' Wheel and Axle Manual and applies to all axles destined for re-use under freight train cars. Effective during 1965, additional stringent re-

strictions were imposed by Rule 84 of the Association of American Railroads' Interchange Manual, which rule prohibits re-use, under any circumstances, of axles which have been subjected to service overheating. The sum total effect of these practices and procedures has been a steady and marked improvement in axle durability with a resultant decrease in the likelihood of service failures and accidents.

While the trend to the improved axle is necessarily gradual, the general quality and durability of axles now in service exceed greatly the similar characteristics of the axle in use during the 1920s, with attendant reduction in the likelihood of service failures.

Bearings—The commonly-known A. A. R. solid bearing or "brass", together with cotton or other thread-type packing waste as a means of conveying oil to the rubbing surfaces, was used without exception on all freight train cars during the 1920s. By way of explanation, the bearing or "brass" is that part of the truck assembly which supports the entire weight of the car body and transmits the load to the axle (the customary freight car is equipped with two four-wheel trucks and the weight of the car body plus a percentage of the truck weight is thus supported on eight bearings). Inasmuch as the axle rotates while the car is in motion, the bearing must have inherent anti-friction properties and must be continuously lubricated to prevent excessive friction and overheating. The standard A. A. R. solid bearing consists of a cast bronze shell lined with an anti-friction metal (a mixture of lead, tin and antimony) machined to fit precisely on the journal portion of the axle. The journal is smoothly and accurately machined to accommodate the solid bearing which rests directly thereon. Because of the smoothness of the journal and the anti-friction qualities of the bearing, the wheels and axle rotate freely provided, of course, that an adequate amount of lubricant is maintained between the journal and the bearing. The lubricant employed is a

moderately heavy mineral oil which is purchased in accordance with rigid Association of American Railroads' specifications and is fed to the journal and thence to the contact between the journal and the bearing by the wicking action of the packing. The packing is inserted in the journal box immediately below and in contact with the journal and thus functions as a wick to convey the oil contained in the bottom of the box direct to the journal where it is wiped from the packing and thence into the contact area between the journal and the brass. During the 1920s, pure cotton or a mixture of cotton and wool threads was used as packing. Constant attention on the part of train yard employes was required to maintain the waste packing in position in order that it could function as an efficient wicking material but regardless of such attention, it was frequently, as a result of heavy impacts (between cars in switching), forced between the bearing and journal with disastrous consequences. In addition to the constant threat of disarranged packing, the journal box employed during the 1920s was not adequately sealed to prevent the loss of oil enroute or the entry of dust, water or other contaminants, the combined effect of which, either singly or collectively, could destroy the lubricating efficiency of the assembly with a resultant "hot box".

The term "hot box" is used universally in the railroad industry and describes a condition resulting from a failure of lubrication, the result of which is increased friction which causes the temperature of the entire assembly to increase progressively unless proper corrective action is taken. In the early stages of the hot box, lining metal is melted from the brass bearing and eventually as the temperature increases, packing material is ignited with resulting fire and danger to equipment and other property. If the condition proceeds, the heat developed is often sufficient to soften the steel in the journal to the point where it cannot support the applied load which results in a journal failure or "burn-off". In spite of constant

attention at stops and terminals, hot boxes were a common occurrence in the 1920s. Statistical data covering the improvements in hot box performance since the 1920s and today is not of great value since in the 1920s freight train runs between stops were short due to the necessity of stopping at frequent intervals for servicing and fueling motive power and many hot boxes were not reported since delays, over and above the normal delays for necessary servicing of the train and motive power, were generally not involved. On the contrary, many of the principal freight trains of today are operated non-stop between terminals and any delays enroute are properly allocated.

In recent years, particularly since the middle 1950s, extensive improvements have been accomplished in journal box lubrication by the use of journal box seals to prevent the loss of oil enroute and the entrance of contaminants and the employment of specially-designed lubricating pads as a means of conveying, via capillary means, the oil in the reservoir to the journal surface. The pads proper consist generally of an oil-proof synthetic rubber sponge encased in a heavy cotton chenille material having high wicking characteristics. The pads are so designed to fit snugly within the oil box and are not ordinarily disarranged under the most severe service conditions. The improved box assembly is in a sense semi-permanent and does not require continual readjustment and oiling on the part of yard forces and is hence not nearly as vulnerable to overheating and failure in the event servicing is inadvertently omitted. Additional improvements in the reliability of the assembly by improvements in metallurgy in the bearing itself and the use of journal stabilizing devices which maintain a constant and predictable position between the bearing, the journal and the lubricating device even under very severe car and truck impacts (severe car impacts occur for the most part during the switching operation in yards and terminals). The merits of the improved journal box assembly have been so well

established that there is an Association of American Railroads' mandatory provision that all new cars purchased for operation in interchange service must be equipped with either roller bearings or stabilized solid bearing assemblies and the same provisions apply, effective August 1, 1966, to all existing cars receiving general repairs.

While the improvements in the conventional solid bearing assembly have been substantial, the largest improvement in axle bearing performance of today arises from the widespread use of grease-lubricated roller bearings. The roller bearing, as the name implies, supports the load between the truck proper and the axle journal by means of hardened steel rollers and thus, for all practical purposes, eliminates sliding friction (except lateral thrust which is insignificant). Additionally, the construction of the roller bearing unit with adequate seals, is such that grease may be employed as a lubricant and relubrication is necessary only at long intervals. At this time, lubrication at three-year periods is required under Association of American Railroad rules but actual tests have shown that bearings may be operated years in excess of this period without distress, thus demonstrating the fact that no troubles will arise if the three-year lubricating period is inadvertently overlooked. As a matter of record, 8,907 cars out of the total of 9,007 cars acquired new by the Missouri Pacific Lines since 1960 have been equipped with roller or totally-enclosed sleeve type bearings. While the statistics show that out of the total car ownership of American railroads, 10% are equipped with roller bearings, the actual percentage of roller bearing-equipped cars noted on our main line trains is in the neighborhood of 24 to 28% due to the fact that the newer types of freight train cars in greatest demand are invariably equipped with roller bearings and such cars necessarily "gravitate" toward our more important red ball movements.

The combined effect of the refinements in the solid bearing assembly and the more widespread use of the roller bear-

ing has been a dramatic improvement in the hot box performance on the Missouri Pacific over the past 8 to 10-year period. Train operation has not changed substantially during the past 10 years (Missouri Pacific was completely dieselized in 1955 and long freight trains, operated on a non-stop basis between terminals, have been the rule rather than the exception since that time) and the improvement in hot box performance was due entirely to factors associated with the bearing assemblies. Performance records show that during 1958, the average number of freight train miles per car switched from the train and set out was only 122,503. The corresponding figure for the entire year of 1965 was practically 10 times this amount or 1,147,563 miles, which figures mean that under current conditions of operation, the likelihood of stopping a freight train either deliberately or accidentally because of a malfunctioning bearing assembly, is only 1/10 of what it was 8 to 10 years ago.

Trucks—At the present time, the cast steel side frame and bolster type of truck of high strength and improved design is in use on practically all types of freight equipment owned by United States railroad systems. While the cast steel truck frame and bolster assembly was in use during the 1920s, it is estimated that in cars operated on the Missouri Pacific, 30 to 35% were equipped with the so-called "arch bar" truck shown in Exhibit 17. As will be seen, this truck is a bolted assembly of steel or wrought iron bars and failures resulting from loose or improperly tightened bolts as well as ruptures of the stress-carrying members were common and derailments and train delays arising therefrom were numerous. The present cast steel truck assembly is comprised of integral castings, carefully designed and manufactured, and is the culmination of over 60 years of research and development. Initial samples of each design of side frame and truck bolster are rigorously tested for adequacy of design in accordance

with rigid Association of American Railroads' specifications before the manufacturer is allowed to manufacture in quantity. These specifications, among other things, require the application of static test loads to the bolster of 3.0 times the normally-applied load without reaching a permanent set and at least 5.0 times the normal load to point of failure. In like manner, the specifications require a static load on the side frame casting of 4.5 times the normal load without exceeding the elastic limit and 12.5 times without causing failure. In addition to the static load test requirement for truck side frames, the Association of American Railroads requires a dynamic test to determine the durability of the design under the repeated stresses occurring during operation.

Because of the acknowledged deficiencies and high incidence of failure of the arch bar truck, the Association of American Railroads took action to prohibit the use of cars equipped with such trucks in interchange effective July 1, 1940. Naturally enough, since that date, the arch bar truck disappeared from railway use and has been supplanted by the cast steel truck assembly which, as previously mentioned, is safe and reliable to a high degree.

Closely associated with the durable type of freight car trucks is the type of spring or springing employed. During the 1920s, all freight cars were, without exception, equipped with relatively stiff coil springs having a total possible deflection from free height to solid height of only 1⅝″. In order to provide better riding qualities and to reduce stresses and wear and tear on the truck assembly as well as the entire car, softer and high deflection springs were gradually adopted. Today, a minimum total spring deflection of 2½″ is required on all new cars and as a matter of general usage, the still softer 3-11/16″ deflection spring is used almost universally on high duty cars. In addition to softer springs, friction devices are

now incorporated into the assembly, the effect of which is to further improve riding qualities and lower operating stresses by the absorption of energy and reducing the tendency of rhythmic or resonant spring deflection and car "bounce". The mandatory use of softer springs and integral snubbing devices of approved types for all cars operated in interchange was effective January 1, 1956 and at the present, it is estimated that upwards of 50% of all cars operated in main line red ball trains are so equipped. Increasing or enhancing riding qualities is effective not only in reducing damage to the car structure as well as the lading but it has the effect of reducing car "bounce" to eliminate the possibility of break-in-twos on line of road resulting from knuckles slipping by due to excessive vertical movement of the couplers.

Couplers—Cast steel automatic knuckle-type couplers were used universally during the 1920s and such couplers were largely of the "D" type adopted in 1919 and a relatively large percentage of earlier designs generally inferior to the "D" coupler. The "D" coupler was superseded in 1936 by the "E" design which is used, with certain minor modifications, in present-day car construction and renewals. The "E" design represents a distinct improvement over the earlier "D" coupler, particularly since the adoption of the alloy steel high-strength body and knuckle in 1962 which is many times stronger than the "D" coupler and provides greater protection against train separations. The present alloy steel coupler and knuckle is designed on the basis of 300,000 pounds total pull plus 80% overload but test data has shown that the actual strength of the coupler materially exceeds this requirement.

Yoke—The coupler at the end of each car is cushioned to prevent hammer blow shocks by a draft gear and connection between the coupler and cushioning device is

accomplished by means of a yoke which permits the draft gear to function both in tension and compression. In tension, the entire force exerted on the coupler is transmitted through the yoke and the failure of this important link would result in a "broken drawbar" and a resulting train separation. Initially, the yoke proper was fabricated from rectangular section wrought iron or mild steel bars but this construction was relatively weak and subject to wear at critical high stress locations and as a consequence, the cast steel Y-type yoke was developed and adopted as an alternate standard by the Association of American Railroads in 1919 for all cars operated in interchange. During the 1920s, however, it is safe to assume that the majority of yokes in service were of the earlier fabricated and riveted design and as a result, yoke failures or "broken or pulled drawbars" were relatively common. In this connection, it may be mentioned that steam locomotives were used universally during this period and because of deficient drawbar pull when starting, it was necessary to "take slack" to start trains with resultant impact shocks and undue stress on the couplers, yokes and remainder of the draft assembly. This, in many instances, created incipient failures which later developed into complete train separations.

Draft Gears—The cushioning device used to reduce impact shocks between cars during coupling as well as road operation and generally referred to as a draft gear, has been materially improved since the 1920s. Draft gears employed in new as well as rebuilt cars must conform to certain Association of American Railroads' minimum standards regarding their ability to absorb energy and thus cope with impact shocks. Prior to 1931, Association of American Railroads' requirements for draft attachments were generally vague and as a result, many cars operated during the 1920s were equipped with inefficient energy-absorbing devices, which fact along with the pre-

viously-mentioned deficiencies in the couplers and yokes, contributed to the prevalence of break-in-twos on line of road.

While the draft gear proper has been greatly improved and strengthened, many cars built today are equipped with the so-called "cushion underframe" on which the car body itself is isolated from and is connected or joined to the couplers and center sill assembly by means of hydraulic or friction shock-absorbing elements. The effect of the cushion underframe is to minimize coupling and slack action shocks to the point where damage to the draft attachments as well as the car lading is reduced to a fraction of that which would occur in cars equipped with conventional rigid underframe subjected to the same conditions.

The effectiveness of a 20" travel cushion underframe in protecting the lading as well as the car structure is such that no more damage will occur at a speed of 12 miles per hour than could be expected with a conventional car of the same weight at a speed of four to five miles per hour.

Center Sills—The minimum strength requirement for the center sill for large numbers of cars operating during the 1920s was vague and indefinite. As the result of an excessive number of failures of cars operated in interchange, the Association of American Railroads attempted to prescribe minimum strengths for center sill construction during 1925 but these requirements were not mandatory and because of the time element, the majority of cars in service during the 1920s were built in accordance with the widely varying standards and car builder's opinions rather than upon proven principles of mechanics. In many instances, the sills were weak and generally inadequate for the loads imposed and break-in-twos resulting from failure of the draft sills as well as complete failures of car bodies were relatively common as compared to the present situation.

In 1929, the Committee on Freight and Passenger Car Construction of the Association of American Railroads published a more detailed specification and minimum standards of design for box cars but naturally enough, the effect of the improved durability of cars built to the new standard was not immediately apparent. To be more specific, it was recommended in the Association of American Railroads' specification in effect during the later 1920s that the center sills of box cars be designed for a yield load of 250,000 pounds as contrasted to current specifications which require a car designed for a yield load of 540,000 pounds. Additionally, the modern freight car is designed to withstand a 1,000,000-pound impact load and an 800,000-pound static compressive load between the couplers whereas in the mid-1920s, no minimum requirement existed for the compressive strength of the center sill assembly.

Returning for a moment to the wooden underframe employed in the car shown in Exhibit 2, such underframes, because of their acknowledged weakness and tendency to fail on line of road, were prohibited by the Association of American Railroads in interchange on January 1, 1935 and one year later, similar underframes of composite wood and steel construction were likewise prohibited.

Car Body Design—Insofar as the body or shell of box, gondola and hopper cars is concerned, the situation mentioned previously in regard to center sill and underframe construction prevailed. In other words, many cars in service during the 1920s were not built to well-defined and generally understood engineering standards but were, on the other hand, built in accordance with "rule of thumb" criteria and as a result, cars received from different builders varied widely in strength and durability. Weaknesses in certain cars became apparent and engineering talent from various railroads and car builders was finally assembled in order to arrive at definite design standards im-

posing minimum strength requirements for principal components. As the result of this action, the American Railway Association (now Association of American Railroads) prepared and issued recommended designs for certain basic cars in 1925 but it is of course obvious that by 1929, an insignificant percentage of cars designed to the new parameters were in actual use.

Since that time, engineering progress has been rapid and continual. The modern car, designed in accordance with existing standards, is durable and for all practical purposes, failure-proof short of actual collision or derailment. In modern car design, the sides, ends and roof (if so equipped) are load-carrying components and contribute to the over-all strength of the assembly as contrasted to the earlier designs in which the underframe alone carried the tension and compressive loads with an insufficient margin of safety to cope with unusually severe loads encountered in operation. Crushing and complete collapse of the older cars under heavy compressive loading was encountered frequently, particularly on flat and gondola cars built with wood or composite wood and steel underframes.

Brakes and Brake Equipment—While the automatic air brake was in use during the 1920s, the application valve known as the "K" type triple valve on each car was simple in construction and relatively crude and erratic in action. With the automatic brake system, the train air line as well as the auxiliary reservoir on each car is fully charged with air from the locomotive at all times when the brakes are released. The brake application is accomplished by reducing the pressure in the brake pipe by the control valve in the cab of the locomotive (or a similar but more simple valve located in the caboose), the effect of which reduction actuates the triple valve and allows air to flow from the auxiliary reservoir to the brake cylinder and thus through a system of linkages which force the brake shoes against the rim of the wheels. To release the brakes,

the process is reversed, that is, air pressure is reintroduced into the brake pipe which reverses the action of the triple valve on each car, with a consequent release of the pressure in the brake cylinder and a recharge of the auxiliary reservoir. The "K" triple valve was prone to stick and be sluggish in action as a result of oil or dirt in the system and as a consequence, brake action was erratic and frequently not completely controllable by the engineman. At times, emergency action occurred (full discharge of the auxiliary reservoir to the brake cylinder), which action would build up a high pressure in the brake cylinder with a resulting rapid deceleration of the train and an almost certain break-in-two because of the relatively weak draft attachments in general use during the 1920s.

An important deficiency of the "K" triple valve arrangement was that the air pressure for service or ordinary brake applications as well as emergency applications was taken from the same auxiliary reservoir. As the result, if the engineman made one or more service applications to reduce the speed of the train and then a situation developed which required an emergency stop, the air pressure in the auxiliary reservoir was usually insufficient to produce any material increase in braking action.

As a result of the deficiencies of the "K" triple valve, the new "AB" brake was developed and made standard for application to all freight cars built new after 1933 and was subsequently made mandatory for all cars operated in interchange service on January 1, 1946 (originally, the "AB" valve was to be mandatory in 1942 but the effective date was postponed because of material shortages occasioned by World War II). The "AB" valve was generally more refined and more efficient than the "K" brake and enabled the engineman to adequately control the braking of much longer trains. In addition to the general refinement, the "AB" valve was equipped with separate service and emergency reservoirs, the effect of which was that

sufficient air is always present to make a high deceleration emergency stop regardless of the number of service applications previously made. The safety aspects of this particular refinement cannot be over-emphasized.

The improvement of the "AB" valve has continued and at present, the so-called "ABD" equipment is available which provides superior and quicker response for both application and release as compared to the original "AB" equipment. Many new cars are now equipped with the new "ABD" valves and their effect in the handling of long trains is already evident in that the time lapse between the action taken by the engineman in the cab and the application and/or release of the brakes to the last car in the train has been sensibly reduced.

In addition to refinements to the pneumatic portion of freight train car brakes, much progress has been made in the strengthening of the purely mechanical portions of the brake system. For instance, the brake beam which applies the pressure directly to the brake shoes and thence to the wheels has been greatly improved and refined during the past years, not only in the strength of the beam proper but in the method of suspension from the truck frame. During the 1920s, brake beams were suspended by means of simple pins and links prone to wear from stress and vibration. This resulted in frequent occurrences of "brake beam down", a form of failure that was unusually dangerous since the beam is so located that if it falls, it strikes the rail directly in front of the wheels. Some years ago, the so-called "Unit" truck was developed in which the pin and link suspension of the beam was eliminated and the beam supported directly by a shelf or abutment on the truck frame and as a result, a "brake beam down" is becoming increasingly rare in railroad operation as the use of the Unit truck increases.

The truck-mounted brake is becoming increasingly common in modern-day car construction. Since brakes of this

type are generally simpler and contain fewer working parts such as pins, levers and rods, they are generally more reliable in operation and, due to their simplicity, are less apt to develop service failures. During the 1920s, simple cast iron brake shoes were used universally but today, the composition shoe is appearing in larger numbers. The composition shoe provides for better train handling since they operate with approximately the same rate of retardation regardless of the speed of the car whereas the retardation rate of the cast iron shoe varies widely with the speed. The frictional effect of the cast iron shoe is much less at high speeds than the composition shoe and greater at very low speeds immediately before the stop is made. Another valuable characteristic of the composition brake shoe is that it is, under all ordinary conditions, non-sparking and danger of igniting trash along the railroad right-of-way, or perhaps the car itself, is non-existent.

Additionally, it has been mandatory for the past several years for all freight train cars to be equipped with automatic brake slack adjusters. These adjusters insure a definite and precise braking effort in response to manipulation of the brake valve by the engineman in contrast to the non-slack adjuster-equipped cars in which uncontrolled wear in the assemblies could produce widely varying braking effect for any given action on the part of the engineer.

In the foregoing portions of this statement, I have listed basic improvements in railway freight cars which have been accomplished in the period between the 1920s and the present. These improvements and refinements have done much to improve the reliability of railroad operation and reduce the hazards to personnel involved in the operation of freight trains. Freight cars in general use today are designed and built to cope fully with the severe operating conditions encountered and are representative of years of experimentation and know-how as contrasted with many cars which were in use during the

1920s, the design of which was based upon opinion rather than upon well-established principles and which were oftentimes built to a price rather than to well-defined and rigid quality standards now imposed by interchange regulations. With diesel-electric motive power, the length of trains has been increased materially and the number of stops enroute reduced compared to the operation of red ball trains during the 1920s but operating records indicate that the strength and durability of the freight train car has been increased over and above that which would be considered necessary to cope with the increased stresses and strains resulting from long train operation.

The foregoing portion of this statement has covered in general terms the improvements made in freight train cars owned by the Missouri Pacific Lines between the 1920s and the present. In this portion of my statement, there were many references to specifications, requirements and minimum standards set forth by the Association of American Railroads, which requirements, etc., govern the minimum quality standards for all freight train cars, whether owned by the Missouri Pacific, other American railroads, private car lines or certain industries.

The Mechanical Division of the Association of American Railroads was organized nearly 100 years ago (the parent organization or the Master Car Builder's Association was formed in 1870) and has, for many years, developed and promulgated basic requirements for all types of cars operated in interchange service. As the result of these rules, the principal components of all types of freight equipment are largely interchangeable, not only insofar as the gauge of track and type and height of coupler is concerned, but also in many other essential parts such as draft gear, draft gear yoke, air brake equipment, hand brake, wheels and axles and in fact, all expendable items, not only to insure minimum strength standards and adequate safety but to provide for ready and easy repair when cars became inoperative on foreign lines.

Interchange Rule 3 of the Association has for years set forth minimum strength and interchangeability requirements for cars operated in interchange, as will be noted from the following, quoted from the 1966 Interchange Rules:

> "Rule 3. All cars built new on and after January 1, 1966 for interchange service (including tank cars as covered by Section AAR.3 (a) of the 'Specifications for Tank Cars') must have materials, design, fabrication, construction and workmanship conforming to Parts I through V of the 'Specifications for Design, Fabrication and Construction of Freight Cars' adopted in 1964 and as may be revised. Inspection as covered in Part 5.3 may be supplemented by special representatives selected by the Mechanical Division.
>
> "No car of an untried type, whether built new, altered or changed, shall be offered or accepted in Interchange, nor accepted from car owner, until its size, capacity and design shall have been approved by the Transportation and Mechanical Divisions of the Association of American Railroads.
>
> "The same principle applies to untried types of trucks, also to major component parts of car body where strength, interchangeability of the parts and the general utility of the car are involved.
>
> "* * *"

In perusing the above quotation, it will be noted that it is based upon the "Specifications for Design, Fabrication and Construction of Freight Cars". Previous rules of the same general intent have been in effect for a number of years but as I stated in my discussion of the changes in construction of the Missouri Pacific cars, the earlier versions of the specifications for minimum standards were not nearly as well defined and as definite as the current specifications which are based upon the accumulated knowledge and experience of railway and equipment manufacturing engineers over the years.

In addition to that portion of Rule 3 previously quoted, more definite requirements are stipulated in regard to air brakes, air brake piping and related equipment, minimum strength requirements for brake beams, brake beam hangers, brake levers, bottom rods and over-all braking power for all cars operated in interchange. Additionally, the Association specifies standards for truck and body center plates, couplers, coupler yokes, side doors on all types of box cars, draft gears, draft key retainers, floor construction of box cars, hand brakes including minimum braking force derived therefrom, journal bearings and bearing lubricating devices, roller bearings and lubricants, slack adjusters, type and design of trucks, minimum standards for wheels, as well as other components which may be involved in strength and durability of the car as related to safety of operation. The maintenance of cars in conformity with minimum Association of American Railroads' requirements is insured by well-understood instructions and competent inspectors at all points where cars are interchanged with foreign lines. It is the prerogative of interchange inspectors to refuse a car which in their judgment is unsafe for operation or which may be dangerous to personnel on the receiving line. Provisions also exist in the Interchange Rules to the effect that the receiving line is permitted to repair foreign cars at the car owner's expense to insure the safety of the car and lading as well as trainmen who may be involved in the operation of the car. The sum total of these requirements is that all cars in operation can be considered as essentially equal in quality and suitable for safe movement, regardless of the owner, and that all cars which may develop defects during operation are promptly repaired and made suitable for safe operation under definite and established rules and regulations regardless of ownership.

Conclusions.

In this statement, I have emphasized many times that the technological improvements in freight train car design and construction between 1920 and 1966 have, in addition to increasing the efficiency of railroad operation, greatly increased the safety of operation and have removed many of the hazards formerly associated with the movement of freight trains. It has also been brought out in this statement that the improvements made in the strength and durability of Missouri Pacific Lines' cars apply also to cars owned by other railroad companies as well as private car lines handled in Missouri Pacific trains, which condition is the necessary result of stringent Association of American Railroads' Interchange Rules requiring that all freight train cars operated in interchange service comply fully with certain minimum strength and safety standards.

The improvements in freight train car construction have not only promoted safety of operation but they have in many instances, eliminated the necessity for emergency corrective action on line of road generally on the part of the freight train crewmen. For instance, during the 1920s, train separations or break-in-twos resulting from general weakness in the car structure or defects in the braking system were relatively common and the additional manpower available in the form of the extra brakeman might have been beneficial in carrying or transporting the necessary chains and other equipment to reunite the train or set the defective cars on the side track. However, because of the many changes in construction described in detail in the foregoing and improved motive power and braking systems, train separations are relatively rare today and the need for the extra brakeman is non-existent.

Similarly, the freight train mileage made between hot box setouts due to refinements in the solid bearing assembly and more widespread use of roller bearings has in-

creased to the point where stopping of freight trains and servicing of hot journals is no longer a serious operating handicap. In instances where hot journals do occur, it is standard practice to set the car from the train for servicing by Car Department forces, and freight train crews, except in rare instances, are not required or expected to carry jacks, brasses and other material to disabled cars to effect correction on line of road and hence, there is no necessity for an extra brakeman.

It is also evident from the reduction in instances of broken wheels, failed trucks (particularly those of the old arch bar type), defective air brakes, etc., between the 1920s and the present, that the need for extra brakemen in correcting difficulties and near accidents on line of road no longer exist.

[Exhibits to Testimony Omitted From Appendix.]

INTERVENORS' REBUTTAL EXHIBIT NO. 26—
Cross-Examination,

By Mr. Ross:

Q. State your name, please, sir. A. Edward C. Meinholtz, St. Louis, Missouri.

Q. And what employment have you had prior to going to work for the Missouri Pacific Railroad Company? A. Well, I was employed during Summer vacations for Scullin Steel Company before going to work for Missouri Pacific.

Q. Mr. Meinholtz, at the bottom of Page 2 of your testimony and at the top of Page 3, you state, "A higher car capacity naturally results in a lesser number of cars required to handle a given tonnage". You are not saying by that that the trains of today usually have fewer cars than trains back in steam days, do you? A. No, that wouldn't be a necessary conclusion.

Q. The Missouri Pacific handles cars from other rail-

roads and also cars owned by various companies other than railroad companies. Is that true? A. Yes, sir.

Q. Would some of these cars still be equipped with arch bar type trucks? A. No. All cars which are interchanged for service between various railroads must comply to certain rules and regulations prescribed by the A. A. R., that is, the Association of American Railroads which set up minimum very definite standards of construction. In other words, the couplers must be, say, a given height above the rails. The truck sights must be of a certain minimum strength. Wheels must be wrought or cast steel, various other requirements.

Q. Do these interchange rules apply to cars privately owned? A. Yes, sir.

Q. Are there any cars left on the Missouri Pacific or any railroads that still have arch bar type trucks? A. None of which are used in revenue service or in general service. I believe we had a couple of old wrecking derricks which still have arch bar trucks, but those were only used towed under low speed. We are attempting to get rid of those, but they are not revenue cars. They are not handled in regular freight trains.

Q. Mr. Meinholtz, the rate of acceleration of diesel electric powered trains is greater than was the rate of acceleration with steam powered trains, is it not? A. Well, of course, generally that would be true if we had, we'll say, equal trains and equal drawbar pulls of the locomotive. I would say that as a general conclusion though with the trains as they are operated today that the modern diesel train will accelerate more rapidly than the steam locomotive train of, we'll say, back in the steam era. It is very difficult to say that definitely because you can well understand that a steam train with only a thousand trailing tons could accelerate faster than a diesel train with four thousand trailing tons. You must qualify that as you can readily see.

Q. Given two trains, one a steam powered train, the other a diesel electric powered train with the same horsepower, would the acceleration rate be greater on the diesel? A. It would be greater with the same horsepower for a given train, yes, sir.

Q. And increased acceleration rate would place greater strain on the knuckles and drawbars of the cars, would it not? A. Well, from the standpoint of your theoretical sphere of mechanics, that is true, the greater your acceleration, the greater your force, but I may qualify that that the difference in the acceleration rate would be relatively small as compared between the two types of motor power. In other words, it would be greater, but it would be of more or less minor difference again assuming that we had the same power in both types of locomotives.

Q. How many diesel electric engines would normally be on the engine consist of a train of four thousand tons? A. Well, there again that would depend upon the requirements as far as the speed is concerned. We operate a train which I am not too familiar with, but I know that we are doing it daily, the so-called piggy-back train that leaves Dupo around nine o'clock in the morning proceeding southward. We would have a greater number of locomotive units to handle that train than we would normally because it is on an expedited schedule. We must arrive at destination within a time to be competitive.

Q. Would you say that the trains of today or rather in the trains of today there is much greater stress on the knuckles and drawbars than there was in steam engine days? A. Well, yes, there is because we are generally, we are powering our trains with a greater number of locomotive units due again to maintain the speed, but at the same time, why, the strength of the various components involved in the draft attachment to which the tractor force is transmitted are of greater strength. In other words, we have gone both ways, but in my opinion our margin of safety has been increasing through the years.

Q. Well, though, the knuckles and drawbars have been strengthened, the stresses under diesel locomotive operations have also increased, have they not? A. They have. You might say the steady and uniform pull, but I might mention this, that the steam locomotive was deficient in its drawbar pull at very low speeds. For that reason it was common practice amongst the enginemen to take slack in the train. They would back up the train and take up the slack between each individual car. Then, as they would start, they would only start in a sense one car at at a time. Very often that would induce very high impact stressing within the train. That is one reason why with diesel locomotive operations even though we have much greater drawbar pull exerted on the first car yet the incidents of break-in two's are quite low because we have eliminated the shock element.

Q. Mr. Meinholtz, when two cars come together in the normal operation of the train in a coupling operation, there is a much greater chance that the cars will couple if both couplings are open, that is, the coupling, both couplings that come together, the couplings are open so that they will come together? A. Both knuckles open so that they will come together. Yes, I believe that is true, yes, sir.

Q. And although these knuckles are referred to as automatic couplers, they still have to be checked before the train is moved to ascertain that a proper coupling has been made. Is that true? A. Well, it's the standard practice that after a coupling is made, why, the switchman will give a signal to the engineer to stretch the train which then he can know at a glance, the engineman can tell by the reaction whether he has made a coupling or not. There is a gravity lock which must fall in behind the knuckle and very often it takes a little pull to set that into place.

Q. And there is some play in the drawbar which at

times will prevent a coupling being made? Is that true? A. Well, I don't know whether it would be through play or slack, but at times we will say due to a malfunction, a coupling will not be made or will not be readily made, but——

Q. Curvature of the track or some slack or play in the drawbar or some malfunction could prevent the coupling? A. That's right from——

Q. From being made? A. That's right, and sometimes it takes a little bit of a jolt to set this gravity lock in place. That is why sometimes a coupling may be made with, you know, a perfectly simple bump, we will say. We don't like to see it be made with anymore than that because it may damage the freight.

Q. The cushioned underframe has been developed to protect the freight itself in this situation, has it not? A. That's true.

Q. To a certain degree? A. Yeah, yeah.

Q. How much does a drawbar weigh, Mr. Meinholtz? Do you know? A. Well, of course—do you mean the coupler and the assembly? I mean a drawbar pertaining to a freight car is a rather misnomer. I mean it consists, you might say, of three parts, the coupler, the yoke and the draft gear and sometimes if one is damaged in route, why, the crew will sometimes report it as a broken drawbar but getting back to the coupler itself, the present D coupler will probably, complete with the lock will weigh in the neighborhood of four hundred pounds, maybe somewhat less than that. It is quite heavy. The yoke will weigh another two hundred pounds and the draft gear perhaps another four hundred on top of that.

Q. When the train extends a pull to drawbar, how much will that part that is pulled away from the car weigh? A. Well, generally that would be the coupler which would be around that four hundred pound figure.

Q. How much does a knuckle weigh? A. Forty-five pounds, forty pounds maybe.

Q. Have you ever handled one of these knuckles? A. Yes, I have. Maybe that's why I said it was forty pounds. Maybe I am getting weak and it just seems like they weigh forty pounds.

Q. Is it easily handled by a man? A. Oh, yes, a man that is experienced with it. I could easily handle one today and you could handle one but I would be clumsy with it however.

Q. A man would usually have some difficulty in walking any distance on the right-of-way carrying a knuckle, would he not? A. Well, any forty pound load. I wouldn't want to do it.

Q. Is it a D type knuckle or what type knuckle is it? A. Well, that is the knuckle for the D coupler. That is known as the D knuckle, yes, sir.

Q. When were the A B type brake valves first or where did they first appear on train equipment? A. Well, at the time this testimony was prepared, I know I had checked on the date where they were finally made mandatory but from recollection, I believe the development work on the A B valve was done in the later twenties or perhaps the early thirties. It wasn't until much later that they were made mandatory and, of course, since, as I recall, the mandatory date was postponed by World War II. It was made mandatory prior to that time but it was postponed. So they have been in wide use you might say for the last twenty-one or twenty-two years.

Q. Is all of Missouri Pacific's equipment equipped with the A B type valves? A. All interchange equipment is, yes, sir.

Q. And the change to the A B type began in the late 1920's or early 1930's? A. The change was not started until I would say the middle 1930's.

Q. What you said then was it was developed? A. The development work, the experimental work. It was developed jointly I believe by the Westinghouse and New York

Air Brake Companies and was finally approved in the early 1930's.

Q. Does the cushion under frame take the place of the draft gear, Mr. Meinholtz, or do you still have draft gears on the cushioned equipped—— A. It is our practice on the Missouri Pacific to employ draft gears as well as the hydraulic cushioning. I don't know if you are familiar generally with the so-called cushion underframe. You might say it consists generally of the center sill, a long strip of steel with the cuppers on each end. The car body itself merely floats on that column of steel. It is connected to the column through hydraulic means so that when the car is struck, the impact forces go through the coupling and then transmit it to the car body only through the hydraulic cushioning device which, of course, minimizes the shock. We actually put a draft gear to help cushion the shock which is transmitted directly to the coupler. It is a separate little improvement which we feel is desirable. Some railroads are building cushion under frame cars without draft gear. It is somewhat debatable. We feel that it is a desirable improvement.

Q. Do all of the cars that are equipped with draft gears have the same type draft gear? A. Well, not the same type but like the other interchange requirements of the Association, all of the draft gears must be of an approved type. They must have a certain minimum shock absorbing capacity. Such gears are listed in the interchange rules book. In other words, if a Missouri Pacific car requires a new draft gear when it is in service on the Pennsylvania, the Pennsylvania must put in an A. A. R. approved gear. So we know in that way all cars in service will comply to certain minimum standards.

Q. After an application of the air brakes, how long is it until the reduction in brake pipe, brake line pipe begins? A. Well, the discharge on the ordinary A B brake system is all accomplished right at the locomotive by the

enginemen. That air must all bleed from the brake pipe through the valve in the cab of the locomotive. In that way it will take a considerable time for that brake pipe reduction to reach, we'll say, the last car of a seventy-five car train which causes the brakes to apply serially, that is, the cars at the front will apply first and then so on down through the train. The improved A B D valve —I believe I mentioned that in here—is an improvement which will effect additional discharge of brake pipe pressure at each car, thereby hastening the application time and very decidedly reducing the period between the application on the head end car and the last car.

Q. Mr. Meinholtz, it is my information that from the time the engineer makes the reduction that seven seconds elapses before any reduction is actually made in the brake pipe, say, on the first trailing car. Is this true? A. I would say that that is not entirely correct. However, I am not an air brake specialist. I couldn't argue the point too much, but I have, well, I guess, less than a year ago if it is permissible to say at the time we had a strike here I ran a locomotive a little bit around the terminal here with the air cut in and I know seven seconds would be a long time and I know I could feel the brakes go on in less than seven seconds. I believe I would have gotten frightened if it had taken that long. I believe that is a little bit long. There again, it depends on the length of the train we are talking about and things like that.

Q. There is an appreciable lapse of time from the time the reduction is made until you feel the application of brakes? A. There is an appreciable lapse.

Q. Do you know the rate on the A B type, do you know the rate at which the reduction travels in the brake pipe? A. I really don't know.

Q. Does this A B D type brake valve being installed on locomotives which Missouri Pacific already has or will it be acquired as Missouri Pacific acquires new locomo-

tives? A. Well, I wanted to bring this out that that is part of the freight car and the A B D valve will work in conjunction with any of the brake equipment on the locomotives. In other words, the A B D valve must be installed on every car in the train. Maybe I should— apparently the beneficial effects of the A B D valves are noticeable if you have up to fifty percent of the cars within the train with that. I believe I started to say that that is the opinion expressed by the air brake companies. We don't have any concrete information to prove that, but we are installing that on most of our new cars that we are now buying today, new freight cars.

Q. Do you know how many cars that Missouri Pacific has which are equipped with the A B D type brake valve? A. I could check that and give you the exact figure, but just offhand I would say in the neighborhood of fifteen hundred as of today.

Q. And that is out of a total car ownership of how many? A. Well, I show that here. I generally think of our car ownership as about forty-five thousand at the present moment. It is forty-six thousand, nine hundred and ninety-one. Forty-seven thousand would be a better figure. I forgot the K. O. and G.

Q. Mr. Meinholtz, insofar as brake in twos are concerned, the train is only as strong as the car in the train containing the weakest equipment insofar as drawbars, knuckles and that sort of thing is concerned? Is that true? A. Well, it would be true under conditions of a uniform pull on a perfectly level piece of railroad at a uniform speed. Very often break-in-twos can happen due to an exceedingly high stress which develops in a particular part of the train due to slack action, run in and run out. In other words, on certain parts of the railroad in this particular case it is not too much in the Arkansas Division because it is a rather level piece of track, but there can be portions of railroads where you have hills and

valley and where car slack runs in and out and it is not beyond comprehension that one of the stronger units may fail if it happens to be so situated, you know, where it gets a jolt and a slack out.

Q. Are you familiar with all the track in Arkansas and the terrain over which that track is located? A. No, I'm not. I am generally familiar with it. I know from Poplar Bluff south to Little Rock it is level as this table and down towards McGehee and that way. At the south end of the main line it is a little hilly, but I am not too familiar with that White River Division. I think that is a hillier division.

* * * *

By Mr. Lessenberry: Q. What term do you use to describe the distance between the wheels of a freight car? A. You mean between the wheels in an individual truck or between the two trucks?

Q. Two trucks? A. We generally refer to that as the truck center, the distance between the center pins about which the trucks swivel.

Q. Is there any relationship of the distance—you just say the truck centers then? A. Yeah.

Q. The distance between the truck centers and the propensity of the car to derail? A. You mean, for instance, under heavy drawbar pull on curved track?

Q. Yes, sir. A. It does have an influence, but I would say the most important factor is not the distance between the truck centers, but it is the distance between the truck center and the pulling phase of the coupler, that is, the overhang, that portion of the car that projects outward from the truck center.

Q. Well, this is determined by the distance between the truck center and the radius of the track? A. No, that is a factor which depends upon how the cars are built. I mean that is built into the car. For years most cars were built with five foot six, five foot six inches overhang be-

tween the truck centers and the end sill of the cars. That was most of your ordinary gondolas, flat cars and hopper cars. Along came these long piggy-back cars and then in order to get that length, the eighty-five and eighty-nine foot length, it was necessary to increase that overhang between the truck centers and the end of the cars and that is a factor which can influence derailment.

Q. All right, now, the size of switches also affects it, does it not, the propensity or the possibility of a car derailment? A. Well, there again I could say I am not a track man, but I know we use extensively a number seven turn out in yards which has a curvature of approximately sixteen degrees and in that respect that can become a determining factor, the curvature, the effect of curvature on the turn-out.

Q. You probably have in your older yards some number four switches, don't you? A. I really don't know. There might be some in isolated areas, but I would say this that in those areas we would not be very apt to operate these exotic cars with the long overhang.

Q. A number four switch as opposed to a number six as you describe has a greater degree, the frog? A. That is my understanding, a greater effective curvature. It is in a sense a sharper curve.

Q. Well, in the train makeup, does the railroad always have the prerogative of determining what type of cars are going on a particular train that will make switching operations in some of these older towns, switching sidings? A. Well, there again, I would say this that our longer cars are used only in piggy-back service and in automobile rack service. Those cars generally shunt or circulate, you know, between well defined points where such cars are unloaded. In other words, they are not apt to be sent into any little passing track or any isolated passing track. If that were true, of course, our engineering department would have to investigate to see if they were such that that could be safely done. That is done daily.

Q. But these are recognized factors in the railroad industry about the length of cars and the turn-outs and so forth as to derailments or other traffic accidents that might occur? A. Well, we know that an eighty-nine foot piggy-back car cannot be handled in the same way that a forty foot box car can. We know that. Those cars, as well as other railroads, such cars have been approved again by the Association of American Railroads for operating in free interchange.

Q. Would you say that there has been a general trend in the railroad industry to increase the length of box cars? A. You say to increase?

Q. Yes. A. I would say that trend is quite definite.

Q. And I think you testified that they are stronger and they carry heavier loads now? A. Yes, sir.

Q. Just through curiosity, are these drawbars sprung in any way? Are they spring loaded? A. Well, the draft gear is—that is the cushioning element. They have springs in them, many of them do, but there are other friction wedges to prevent the spring from suddenly reacting. You see, it is an energy absorbing device. It is not a simple spring.

* * * *

Redirect Examination,

By Mr. Lucente:

Q. Is there in effect an A. A. R. interchange rule prescribing a minimum brake shoe force for brake service cars? A. Yes, sir. For cars to be operated in free interchange, they must have a certain minimum air brake deficiency, let's say; that is, the present rule states that the total combined force of all eight brake shoes or as the case may be, they may be more or less, depending upon the number of wheels in the truck, must in combination exert a force equal to eighteen percent of the total weight on rail of the loaded car. Then, at the same time that the braking effort must be as close to seventy-five percent of the light weight of the car.

Q. Is that a requirement which has recently been changed? A. That has been changed within the last two to three years. It was formerly eighteen percent of the loaded weight but the light weight was down in the neighborhood of fifty to sixty percent. I don't recall exactly. In other words, the present rules require for a greater deal of retardation than was in effect.

Q. Did that change occur in 1963? A. I believe that was the date.

Q. With respect to changes in hand brakes, Mr. Meinholtz, does Exhibit 2 to your statement show the type of hand brake that was in use on most Missouri Pacific cars in the late 1920's and early 1930's? A. I would say that the majority of cars were equipped with a hand brake similar to that shown on those two cars.

Q. Was that hand brake geared at all? A. At that time they were not geared. There was merely a vertical staff. The chain was wound around the staff and it was necessary in those days for a brakeman to put a wooden club in between the spokes for that wheel to give him greater leverage to effect any degree of retardation to the car. It was some time after that the geared hand brake was required and at the present moment, why, with the geared hand brake by applying a force of one hundred and twenty pounds at the rim of the wheel, the hand brake force will then be equivalent to fifty pounds brake cylinder pressure, that is, from the air brake. In other words, a man by applying one hundred and twenty pounds to the rim of the wheel can exert the same braking force as is produced by a full service reduction of the automatic air brake.

Q. Is the type of brake you have described as being of more recent vintage shown on the tank car appearing in Exhibit 14 to your statement, Mr. Meinholtz? A. Yeah, that is a vertical geared hand brake, yes, sir.

* * * *

Recross-Examination,

By Mr. Ross:

Q. Mr. Meinholtz, your hand brakes are located only on end of each car? A. That is correct. There might be exceptions to that for some of these special heavy duty depressed center cars used for transporting heavy transformers and steam generator parts in which they might have a hand brake on each end of the car but your normal interchange car is just equipped with a single hand brake.

* * * *

PLAINTIFFS' EXHIBIT NO. 27—
Testimony of Charles T. Marak.

My name is Charles T. Marak, I am Signal Engineer, Missouri Pacific Railroad System, with headquarters at Room 1260, Missouri Pacific Building, 1218 Olive Street, St. Louis, Missouri 63103. My duties are to administer, direct and supervise engineering, construction and maintenance of all types of railroad signaling, interlocking plants, and other safety devices used in connection with train operation on the Missouri Pacific System and its operating lines. I am responsible for engineering, plans, specifications, rules, standards and instructions for installation, inspection, maintenance and repair of automatic block signals, interlocking plants, highway crossing protection, traffic control systems, automatic classification yards, various types of safety devices and other similar appliances, methods and systems. In connection with these systems and appliances, I am responsible for carrying out the requirements of and reporting, preparing applications, etc., to the Bureau of Safety and Service of the Interstate Commerce Commission and State Public Service Commissions as prescribed. My entire experience since I was employed on June 20, 1925, has been in the field of railroad

signaling and I have been continuously employed by the Missouri Pacific Railroad for 41 years, serving in various positions in construction, maintenance and engineering of signal systems and devices on the Railroad system, which includes Arkansas. I have served as Signalman, Signal Foreman, Supervisor, General Signal Inspector, Draftsman and Circuit Designer, Engineer Accountant, and Assistant Signal Engineer prior to my appointment as Signal Engineer on April 1, 1953. I am a graduate of the University of Arkansas with a degree of Bachelor of Science in Electrical Engineering, Registered Professional Engineer of the State of Missouri; past member of Committee of Direction, Signal Section, and Subcommittee Chairman of Interlocking and Traffic Control Signaling, of the Association of American Railroads; committee member of interlocking, Traffic Control and Block Signaling of the Communication and Signal Section of the Association of American Railroads; committee member of the Uniform Code of Operating Rules, which rules are used by railroads operating in the Southwest. My testimony relates to the various types of signal protection and devices used on American railroads including those operating in Arkansas. I shall describe these systems and their historical development. I shall also present statistics relating to signal protection on the Missouri Pacific Railroad within the State of Arkansas. Although some of this information applies particularly to signal systems and devices on the Missouri Pacific Railroad used in the State of Arkansas, the principles and their general application are also characteristic of the signal systems on other individual railroads operating within the State.

HISTORICAL DEVELOPMENT OF SIGNALING.

Signaling is as old as railroading; when there was only one train, there was no problem to operate, but as soon as there were two or more trains operating on the same

tracks, problems arose which led to the development of the present signal systems.

During the early transportation years, study was directed along the lines of providing adequate track construction and efficiency in locomotive and car design. Traffic was controlled by hand signaling at first; but as time passed and traffic grew in volume, the need for a more comprehensive method of directing traffic than hand signaling became apparent. Various and sundry methods were devised for obtaining and transmitting information with respect to train movements and for train control purposes.

During those early days of railroading when trains operated on single track, sidings were built a few miles apart to enable the trains to pass. Halfway between these sidings a tall post was erected and the train first reaching this center post had the right of way to the next siding, the other train having to back up to that point.

Later, about the year 1860, timetables were prepared to show the time of arrivals and departure of trains at junctions or terminal points, but they were never taken seriously and delays were frequent from any causes. Then trains were scheduled to show the meeting points. However, there still were frequent delays and many trains which were on schedule were compelled to wait hours at some scheduled meeting point. It was then that many schemes were devised for obtaining and transmitting information as to train movements; hand signals, supplemented by flags in the daytime and by barn lanterns at night, were used. When hand signals, flags and lanterns were found inadequate, the railroads began to apply mechanical devices located at stations to indicate when a train was enroute to the next station. One of the earliest types of signals used consisted of a red ball about two feet in diameter, mounted on a high pole, the ball being raised or lowered by use of a continuous chain; when raised to

the top of the pole, it gave the "Proceed" indication to a train, as shown on page 1 of my illustrative exhibit. Thus originated the term "high ball" which one hears so frequently in connection with the operation of trains. As no audible means of communications existed between stations, the signals were observed from adjacent stations by marine telescope. This primitive method of signaling the movement of the train by visual signals was used prior to the invention of telegraph.

With the use of telegraph, prior to and in the early years of the 1900's, train movements could be made at night with stations farther apart. Then the "ball" signal system was replaced with train order signals, as shown on page 2 of my exhibit, and the "train order" system was used to supplement the "timetable" system. With this system, all intermediate stations would report (OS trains) to the dispatcher as the trains passed their stations. With this information the train dispatcher could change the time schedule for meeting and passing of trains to avoid long delays if one of the trains was off schedule. To avoid long train orders, trains were given superiority by "class." Passenger trains were made "1st class" and freight trains, "2nd class." The "2nd class" trains would be required to take siding 10 minutes ahead of the schedule, or train order time of opposing "1st class" trains. Trains of the same class were given superior rights by direction. This system worked out satisfactorily when there were few trains, but as more trains operated, human errors occurred, such as dispatchers issuing wrong orders, operators making mistakes in copying orders, train crews misinterpreting orders or overlooking orders, etc..

It was due to the train accidents and the need of trains to be able to warn other trains of their presence, rather than depending on the operator, that track circuits applied to the rails were devised, and with these track circuits "controlled manual block system" and "automatic block

signal system" were first used. These first automatic block signals installed on Missouri Pacific in 1904 were semaphore signals with oil lamps as shown on page 3 of my exhibit, and the color-light modern type signals shown on page 4 of the exhibit were first placed in general use about 1920.

Photograph on page 5 of my exhibit shows typical lock and block equipment used at a station. These track circuits also provided means to detect broken rails, switches improperly lined, cars not in the clear on side tracks and sidings, etc. Also, during this interim interlocking plants were developed to eliminate train stops at railroad crossings and the necessity for hand operating switches in yards and at junctions. These original plants were mechanical type with use of pipe or wire lines to throw switches and actuate the signals. Page 6 of the exhibit shows a typical mechanical dwarf type semaphore signal used at interlocking plants.

When train movements were controlled entirely by train schedules as in early days, and by timetable and train orders only in later days, trains were operated by the Time Interval Method. The chief purpose of this method of train operation was to keep trains apart, when running, by a certain period of time. Under this system, all trains were expected to reach meeting points or passing points in ample time for inferior trains to clear for the superior trains. In this Time Interval Method, the crew of a given train between stations had no way of knowing the location of a train ahead except by flagman protection. This time interval system was the only method of controlling train movements for many years, but as traffic became heavier, requiring the running of more trains at higher speeds, it was found necessary to provide means to make train operation safer. As a result, the Space Interval Method was introduced. Under this system, the railroad is divided into a number of sections, or "blocks", with

a fixed wayside signal placed at the entrance to each block. This signal indicates to the enginemen of an approaching train whether the block is occupied by another train. Under this system, trains are spaced with certainty. Trains operating under this method are directed by timetable and train orders with the protection of automatic block signals, extensively used in Arkansas since 1925, or are directed by signal indication by the centralized control system, which has been used subsequent to 1929.

Centralized traffic control type of signaling to permit train operation by signal indications without the use of train orders and without the superiority of trains was first installed on Missouri Pacific Railroad during 1929. The type of color-light type of signals used and operated from remote stations and centralized traffic control machines is shown on pages 7 and 8 of the exhibit. Photograph on page 9 of my exhibit shows the first CTC control machine on Missouri Pacific Railroad. This system is superimposed upon automatic block signal system and includes safety circuits as required by the Bureau of Safety of I. C. C. All major Missouri Pacific primary main lines within the State of Arkansas have traffic control signaling. This system is based upon the coordination of established practices long used in automatic block signaling and interlocking systems. All signal functions are dependent primarily upon the occupied or unoccupied condition of the block and the check between opposing signals, and secondarily upon the will of the operator. The same electrical safeguards are employed as are used in connection with interlocking. The system is completely "foolproof" through use of safety circuits, in that it is impossible for improper manipulation of control levers to set up an unsafe condition for train movements. The time element in the transmission of orders is practically eliminated, and more efficient dispatching is the result. Direct control

over the movement of each train is made possible without depending upon a delivery of train orders at intermediate stations, eliminating potential human errors that may occur with the handling of train orders. Instructions given by signal indicators require less effort in preparation and transmittal than do written instructions. They are delivered to the engineman through the medium of the signal. The language of the signal is easy to understand and difficult to forget.

DESCRIPTION OF METHODS USED IN TRAIN OPERATION.

As a result of the historical developments which I have described, there are various methods of directing train operation through the use of signal systems and devices. The principal current methods are the following:

Timetable and Train Order System,
Manual Block System,
Controlled Manual Block System,
Automatic Block Signal System,
Centralized Traffic Control System.

Timetable and Train Order System.

Basic authority for the operation of trains under this system is the timetable, supplemented by train orders. The train order signal is the medium used for the direction of trains and when displayed at a station or office, it indicates to a train "Whether or not it will receive orders".

Under this system, trains proceed upon authority conferred upon them by the timetable or by train orders which have been delivered to them.

Trains in the same direction proceed in accordance with the rights which each may have and the rule which requires station to station clearance where an inferior train is preceding a superior train. At passing point it is gener-

ally the practice to prescribe a time interval between two or more departing trains in the same direction.

The timetable and train order system is in use on lines of light density and where there are few conflicts between trains over the 24-hour period.

Manual Block System.

A series of consecutive blocks, governed by block signals operated manually, upon information transmitted by telegraph, telephone or other means of communication.

Controlled Manual Block System.

A series of consecutive blocks governed by block signals controlled by continuous track circuits, operated manually upon information transmitted by telegraph, telephone or other means of communication, and so constructed as to require the cooperation of the signal men at both ends of the block to display a clear or a permissive block signal.

The distinctive feature of the manual block system is that the signals, one at each of the opposing entrances to a block, are controlled manually.

In the manual block system of directing train movements, a manual block signal, normally at stop, is used for spacing trains between block offices. If only one train is permitted to occupy the block, it is known as absolute block; if a train is permitted to follow another train in the block, it is a permissive block.

A distinctive signal is displayed or appropriate clearance card issued to the train so that the engineman knows whether the block is clear or occupied by a train ahead in the same block.

Operation of trains on single track under this type of block signaling in no way dispenses with superiority of trains as established by timetable or by train order, and all other rules remain in effect to prescribe among other

requirements the method of clearing both as to opposing and following movements and as to flag protection.

Automatic Block Signal System.

This system of signal protection is defined by the AAR as: "A series of consecutive blocks governed by block signals, cab signals or both, actuated by a train, or engine, or certain conditions affecting the use of a block."[6]

A block is defined as "A length of track of defined limits, the use of which is governed by block signals, cab signals or both."

With the automatic block system the train automatically operates the signal that protects it.

The fundamental element of the automatic block signal system is the continuous track circuit which provides a method of maintaining a space interval between following and opposing train movements. The space interval or block may vary in length from a few hundred feet to two or more miles, the average length being about one and one-half miles for following movements, and for opposing train movements the block extends from siding to siding that are generally spaced about eight to ten miles apart.

The use of an automatic block signal system on single track line does not eliminate the use of train orders or abolish superiority of trains as established on the timetable. Its principal use is to check the safe movement of the train.

Centralized Traffic Control.

The AAR definition is: "A term applied to a system of railroad operation by means of which the movement of trains over routes and through blocks on a designated section of track or tracks is directed by signals controlled from a designated point without requiring the use of train orders and without the superiority of trains."

A traffic control system is controlled by a dispatcher or control machine operator from a traffic control machine, which may be located in the territory or may be many miles removed therefrom. Selected passing siding in the territory are equipped with power-operated controlled switches and associated signals. Approach signals are provided in the approach to the main track controlled signals located at the ends of sidings. The signal blocks are absolute blocks for opposing movements and may also be absolute blocks for following movements. By "absolute" I mean that only one train at a time may occupy the block. Train operation in traffic control territory is by signal indication. The field signal circuits are designed so that the traffic-control-machine operator cannot clear signals for opposing or conflicting routes. The operator receives indications on his machine concerning the position of power-operated switches and the aspect displayed by controlled signals. He also receives indications showing the location of trains in the territory. If a broken rail exists, a hand-operated switch is open, a derail is off the rail, or a train or car is in the block governed by a controlled signal, signal aspects permitting entry into the block cannot be displayed, even if the operator in error attempted to do so. The operator would also have an indication that one or more of the mentioned conditions existed in the block.

At a siding for meeting and passing of trains, where trains operate at a speed of 20 MPH or more, the switches of such a siding are either provided with power-operated switch machine or are electrically locked.

Before the dispatcher or control-machine operator can clear the signal to permit entry of the train into the block in which a switch is located, the signal system automatically checks to determine that the opposing signal displays a Stop aspect and that this Stop aspect has been displayed for a predetermined time. The signal system

is designed so that it is impossible for opposing signals simultaneously to display aspects permitting movement into the block. When the train enters the block the signal will display Stop aspect as soon as any part of the train passes it, and the opposing signal will remain in Stop position. Thus, with a train in the block, both signals governing entry into the block display Stop aspects. The train will then proceed in the block on authority of the aspect displayed by the signal at entrance to the block. In a traffic-controlled system all controlled signals are normally in the Red or Stop position.

The advantage of the use of centralized traffic control signaling are many. From an operating viewpoint, the time element in the transmission of orders is eliminated, resulting in more efficient dispatching. Train movements are constantly monitored so that information on train location is complete and up to the minute at all times, permitting moves to be planned more effectively. Direct control over the movement of each train is made possible without depending upon a cumbersome system or method involving intermediate steps for the delivery of train orders. The most flexible type of train operation results. Expedited train movements are inherent in a C. T. C. system since the efficiency of the train dispatcher is tremendously increased. Each order, consisting only of a code sent by the dispatcher is delivered to the train by signal indication at the point where it is to be executed. Thus, the dispatcher's control is direct over all train movements at all times. Operating expenses are also reduced by the C. T. C. system in that it provides greater efficiency in the movement of trains, by reducing the number of train hours, and by the elimination of many train stops. In addition to the operating and economic benefits of C. T. C. signaling is its inherent safety feature. By eliminating the "train order" C. T. C. avoids the issuance of improper orders, faulty transmission of orders

or other human errors. In addition the C. T. C. system is completely fail-safe through the use of safety circuits, thus making it impossible for the dispatcher to set up an unsafe condition.

I have previously referred to an electrically locked switch. An electric lock is essentially an electromagnetic device electrically controlled, which can restrict or prevent mechanical manipulation of an interlocking lever, switch stand, switch machine or similar apparatus. As applied to a hand-operated switch, an electric lock will prevent opening of the switch unless predetermined conditions exist. The electric lock in locked condition prevents movement of the switch-stand operating lever. When a train desires to enter an electrically-locked spur track, the electric lock is automatically conditioned for unlocking by the use of a short track circuit or track instrument located in the main track immediately ahead of the switch point. On page 10 of the exhibit is shown an electric lock on a hand-throw switch stand.

If a train is in the spur track or siding with electrically-locked switch and desires to enter the main track, the dispatcher or operator must be contacted and permission obtained for such entry. After receiving permission to open the switch, a member of the crew opens the door of the electric lock, which will activate the apparatus located at the opposing controlled signals. This apparatus will detect whether these signals are in the Stop position and have been in Stop position for the required predetermined time before the electric lock releases the switch to be operated.

I wish to emphasize that all switch positions are checked and all signals governing entry into a block are held in the Stop position when switch points are open ¼″ or more from the normal position.

HISTORY OF SIGNALING ON MISSOURI PACIFIC RAILROAD.

In 1904, during the World's Fair in St. Louis, the first automatic block signals were installed on the Missouri Pacific between St. Louis and Washington, Missouri, a distance of 52 miles, and between St. Louis (Tower Grove) and DeSoto, Missouri, a distance of 42 miles.

The next installations of importance were made during the years 1908 to 1910, when the automatic signal system was extended from DeSoto to Hogan, Missouri, a distance of 54 miles. These signals were semaphore type with oil lamps.

It was not until 1917 and 1918 that additional automatic signals of any importance were installed. During those years, signals were extended from Hogan, Missouri, to Poplar Bluff, Missouri, and from Washington, Missouri, to Cole Junction, just west of Jefferson City, Missouri, a distance of 76 miles.

Signal Statistics as of 1918 on Missouri Pacific R. R.

	Track Miles Auto. Blk. Sigs.	Controlled Manual Blk.	Miles of Track
M. P. Railroad	331.74	12.22	7,380
Arkansas	0	0	1,365

From 1918 until 1924, the signaling was primarily at railroad grade crossing and highway crossings.

In 1926, to provide safety and efficiency in train operation, a 10-year signal program was planned, contemplating automatic block protection on most of the principal main lines of the railroad. In this connection, during the years 1925, 1926 and 1927, absolute-permissive automatic block signal systems were installed between Poplar Bluff, Missouri, and Texarkana, Arkansas, a distance of 326 miles; Memphis, Tennessee, to Bald Knob, Arkansas, a distance of 88 miles; and between Benton and Hot Springs, Arkansas, a distance of 30 miles.

Signal Statistics as of 1930 on Missouri Pacific R. R.

	C. T. C. Sigs.	Controlled Manual and Auto. Blk. Sigs.	Miles of Track
M. P. Railroad	162	1421	7,837
Arkansas	37	516	1,959

A system plan showing Missouri Pacific tracks and signals as obtained on January 1, 1930 will be found on page 11 of my exhibit. The legend on the plan indicates the type of signal systems used and their location at that time. The traffic control signal system extended over short sections of track at Bald Knob, North Little Rock, Benton and Gurdon, as shown in solid lines on page 11, consisting of a total of 37 miles within the State of Arkansas. The automatic block signal systems within the State are shown in hatched lines and extend from the Arkansas-Missouri State line at Corning, Arkansas, to the Arkansas-Texas State line at Texarkana, except for the 37 miles of the short section of traffic control systems referred to in the above; Bald Knob to Arkansas-Tennessee State line near West Memphis; and between Benton and Hot Springs, Arkansas, a total of 516 miles. All other tracks shown but not designated by symbols on the plan are tracks where train operation was governed by timetables and train orders without signals.

Subsequent to 1930, more extensive and better signal systems were developed both for safety and to facilitate train movements. For operating, economic, and additional safety benefits, as previously described, the Missouri Pacific has installed the most modern centralized traffic control systems on heavy density lines; various types of automatic protection were added to the signal systems, such as high water detectors, rock slide detectors, fire protection, hot box detectors, broken wheel and flange detectors, dragging equipment detectors, electric locks on hand-throw switches, etc.

On page 12 of my exhibit is an excerpt from the "Business Week" dated November 11, 1944, which presents a

brief description of how CTC signaling works and how its efficiency has been demonstrated on the Missouri Pacific main line serving the Southwest through the State of Arkansas.

During the years 1958 to 1966, the CTC control machines on the Arkansas Division, which extends from Poplar Bluff to Texarkana, were consolidated and then relocated to Little Rock, Arkansas, to have all of the traffic control system at the District office, where direct supervision can be administered for improved efficiency and control of train operation.

The control machines located at Malvern, Arkansas, and Hope, Arkansas, as shown on page 13 of the exhibit were consolidated with the control machine at Gurdon on May 8, 1958. A close-up feature of this control machine after consolidation at Gurdon appears on page 14 of the exhibit. On January 25, 1966, this machine was relocated to Little Rock.

The CTC control machine located at Knobel, Arkansas, was relocated and consolidated with the control machine at Newport, Arkansas, on January 18, 1960. A photograph of the two control machines that were at Newport and Knobel, Arkansas, prior to the consolidation, are shown on page 15 of the exhibit.

The CTC control machines were relocated from Bald Knob, Arkansas, and consolidated with the control machine at Little Rock on July 28, 1961. Then the control machines at Newport were relocated and consolidated with the Little Rock control machine on July 25, 1963. The control machines after consolidation at Little Rock are shown on page 16 of the exhibit.

On May 6, 1965, centralized traffic control system was installed between East Little Rock and McGehee, Arkansas, on the territory where there were no signals—a distance of 101 miles; and automatic block signal system replaced with centralized traffic control signals south of

McGehee, Arkansas, to the Arkansas-Louisiana State line at Wilmot, Arkansas, an approximate distance of 42 miles, on June 15, 1965. These facilities are all controlled from the CTC control machine located at Little Rock.

Signal Statistics as of January 1, 1966 on Missouri Pacific R. R.

	C. T. C. Sigs. Miles Trk.	Automatic Block	Miles Road	Miles Track
M. P. Railroad	1,449	1,615	6,436	6,813
Arkansas	563	254	1,647	1,761

A system plan showing Missouri Pacific tracks and signals as of January 1, 1966, will be found on page 17 of my exhibit. The legend on the plan indicates the type of signal systems and their location. The centralized traffic control signal system on main tracks within the State of Arkansas is shown in solid lines. This traffic control system extends across the State from Arkansas-Missouri state line at Corning, Arkansas, to the Arkansas-Texas state line at Texarkana, and between East Little Rock and McGehee to the Arkansas-Louisiana state line at Wilmot, Arkansas, a total of 563 miles. The automatic block signal system is shown on the map in hatched lines, extending from North Little Rock to the Arkansas-Oklahoma state line at Van Buren, Arkansas, and from Bald Knob to the Arkansas-Tennessee state line near West Memphis, a distance of 254 miles. The tracks not designated by symbols on plan are branch lines where trains operate by timetable and train orders without signals. The automatic block signals and Missouri Pacific tracks between Benton and Hot Springs, a distance of 27 miles, were retired May 5, 1964.

The Interstate Commerce Commission Bureau of Safety and Service published a tabulation of statistics pertaining to signals and devices on all Class I and Class II line-haul railroads in the United States, which information is shown on tables page 18 and page 19 of the exhibit. These tables show the miles of road and miles of track of automatic block signals, train stop, train

control and cab signals, centralized traffic control, and non-automatic block signals for the years 1922 to 1964, inclusive.

The Missouri Pacific Railroad has taken advantage of the most modern developments of signaling to improve overall safety and greater efficiency in the movement of trains, particularly since 1930. For a comparison of the improvements made in Automatic Block Signals and Centralized Traffic Control Signaling, my illustrative exhibit page 11 shows the signaling in service on the Missouri Pacific Railroad proper as of January 1, 1930, and on page 17 the signaling as of January 1, 1966. Since 1930 the Missouri Pacific Railroad acquired in its system of operation The Gulf Coast Lines on May, 1956, and The Texas & Pacific Railway on April, 1962, the signaling on the Missouri Pacific Railroad system, as a whole, is shown on Plan, page 20 of the exhibit.

HISTORICAL DEVELOPMENT OF INTERLOCKING PLANT.

Interlocking is a part of the general subject of signaling; it is used at railroad crossings at grade, at junction points, movable bridges and other points where traffic conditions require the expeditious movement of trains with safety. In the early days of railroading, a watchman or attendant was positioned at each such location. This attendant would control the movement of trains with the use of flags or lanterns.

As the need to expedite the movement of trains with safety increased, a mechanical-type interlocking system was devised. This system employed pipe for connecting the switches and signals to the levers in the interlocking machine which was housed in the interlocking station. The requirement of moving the levers that controlled the switches and signals in a predetermined order was accomplished by an arrangement termed "mechanical

locking". This machine, by use of locking feature, prevented the simultaneous clearing of signals for conflicting routes.

The first mechanical-interlocking arrangement antedated automatic block signaling by many years and was used extensively. However, with the invention of the track circuit and other developments in the industry, such as power switch machines, electric signals and more compact interlocking machines, interlocking underwent a major renovation. With these new devices it was possible to extend the area controlled by interlocked switches and signals from a few hundred feet to a distance of several thousand feet. Likewise, as these electrical components were added to interlocking, it became possible to operate much more extensive layouts more safely and with fewer men. The science of railroad interlocking has proceeded through a gradual technological evolution, which, chronologically, is something like the following: mechanical interlocking, electro-mechanical interlocking, power and relay interlocking, automatic interlocking and route interlocking.

Shortly before the turn of the 20th century, electric switch machines were invented and developed to some degree of proficiency. With power switch machines, as shown on page 21 of the exhibit, manual switch operation was no longer necessary, and power interlocking plants then became feasible and practical. This, in turn, led to the practice—first taken in about 1929—of relying entirely on relay safety circuits. In relay interlocking, miniature levers are located on a machine which displays actual track conditions on a diagram-type board.

At railroad grade crossings where there were no complex routes and large number of train movements, an automatic-type interlocking plant was developed and fully accepted during the early part of the 1930's. The principle of this type of plant is that the trains themselves establish their own routes, taking the place of the op-

erator. This is done by a train's presence on approach track circuit. If all conflicting route signals indicate "Stop" and the movement is safe for the approaching train over the crossing or route, this train will receive a "Proceed" indication. However, if a conflicting movement is in progress, the approaching train will receive a "Stop" signal. On page 22 of my exhibit is a photograph of a typical automatic plant at a railroad crossing.

At locations where there are a number of complex routes and a large number of train movements as in the busy terminal at North Little Rock, a route-type traffic-control interlocking was developed during year of 1952. This system bears a marked resemblance to the individual-lever centralized-traffic controlled system. The one important departure, however, is in the method of setting up routes. With the individual lever (C. T. C.) system, the dispatcher is obliged to analyze the route into specific junctions, such as switches and signals. With the route-type traffic-controlled interlocking system, advantage is taken of the fact that all routes in a terminal or junction have "entrances" and "exits". If the operator or dispatcher knows where a train is entering and leaving the plant, he has all the information necessary to direct that train by the Entrance-Exit System, commonly called the "NX" or "UR" electric interlocking. At the approach of a train, the operator is informed in one way or another as to the point of entrance; on his control board he turns the entrance knob at that point. Knowing where he should direct the train, he pushes the exit button. The rest is automatic; immediately, the route lines up for the movement. In the field the switches automatically position themselves and the signals clear if route is clear and safe for the movement of the train. Indications are shown on the controlled board that the switches have operated in correspondence with the control and have locked up, and operator knows that the signal is clear. He watches the progress of the train

through the plant by successive illumination of the track-occupancy lights. He can tell at a glance exactly where the trains are at any time in the control area. If there are several routes which a train might take from entrance to exit, and another train or a set-up route is blocking the normal route, this system automatically chooses a second route without any action on the part of the operator. This system provides simplicity of operation with all safeguards for the movement of trains. The operator never has to think in terms of switches and signals. His sole concern is that of identifying routes by their "entrances" and "exits". This naturally permits simple, smooth and coordinated operation of the entire plant. On page 23 of the exhibit is shown a modern route type of plant similar to the one used on the Missouri Pacific at North Little Rock, Arkansas.

Interlocking.

The Association of American Railroads defines **Interlocking** as: "An arrangement of signals and signal appliances so interconnected that their movements must succeed each other in proper sequence and for which interlocking rules are in effect. It may be operated manually or automatically."

Interlocking, Manual, as: "An arrangement of signals and signal appliances operated from an interlocking machine and so interconnected by means of mechanical and/or electric locking that their movements must succeed each other in proper sequence, train movements over all routes being governed by signal indication."

Interlocking, Automatic, as: "An arrangement of signals, with or without other signal appliances, which functions through the exercise of inherent powers as distinguished from those whose functions are controlled manually and which are so interconnected by means of

electric circuits that their movements must succeed each other in proper sequence, train movements over all routes being governed by signal indication."

Interlocking, Route Type, as: "An all-relay system in which the route principle of function control is provided. Complete routes may be established through the plant with this type of machine by the manipulation of a control button at the entering end of a route and another button at the leaving end. By this action the complete route is automatically established, including the throwing of the required switches and the clearing of the desired signal."

The statistics for interlocking plants installed on the Missouri Pacific System and within the State of Arkansas are as follows:

	Mechanical	Power-Operated Remote Control	Automatic	Electric	Route Type (CTC)
1918—1/1/18					
M. P. Railroad	84	13	0	0	0
Arkansas	10	0	0	0	0
1930—1/1/30					
M. P. Railroad	99	14	9	0	0
Arkansas	13	0	2	0	0
1966—1/1/66					
M. P. Railroad	24	21	97	21	3
Arkansas	3	0	10	1	1

The locations of these plants within the State of Arkansas are as follows:

Mechanical Plants	Automatic Plant		Electric Plants	Route-Type Plant
Movable River Bridges at:	Fair Oaks	(MP-StLSW)	Forest City	North Little Rock
Newport	Camden	(MP-StLSW)		
New Augusta	Presley Jct.	(MP-CRI&P)		
Mozart	Haskell	(MP-CRI&P)		
	Hoxie	(MP-StL-SF)		
	Little Rock	(MP-CRI&P)		
	Pine Bluff	(MP-StLSW)		
	Nettleton	(MP-StL-SF)		
	E. Little Rock	(MP-CRI&P)		
	Van Buren	(MP-StL-SF)		

HISTORY AND DEVELOPMENT OF HIGHWAY CROSSING PROTECTION.

As with all of the other types of railroad signaling equipment, highway crossing protection has come through a long period of evolution but, relatively speaking, not as lengthy as train signaling or interlocking. Actually, there was no real need for rail-highway grade crossing protective devices until many years after the advent of railroad service. In the horse-and-buggy days, simple signs at the crossing to tell one to "Stop, Look and Listen" or "Look Out for the Locomotive" were quite adequate. Some of the types used are shown on page 24 of the exhibit. These signs were soon being supplemented and in many instances replaced by signs more or less arranged in the form of crossbuck, apparently to simulate the bones of the "Grim Reaper's" label. Strangely enough before the advent of the automobile, people crossed railroad tracks, either walking, by horseback or in carriages, but collisions with trains seldom occurred.

With the increase in population, more trains operating at higher speed and because many crossings were so located that the view of approaching trains was restricted, need for better protection became more apparent. Flagmen as shown on page 25 and manually-operated gates as shown on page 26 of the exhibit were used in cities and villages at crossings. Where there was less vehicular traffic, warning bells with loud, distinctive tone were installed and these were operated automatically by the approach of a train. Then a little later, a magnetically-operated swinging red banner was added to the usual bell warning, and the swing banner carried a red light for the night indication. A banner-type signal is shown on page 27 of the exhibit.

With the advent of automobiles and trucks, various types of devices were installed, but the greatest objection to these devices was the total lack of uniformity or stand-

ardization. With the automobile and its general use, the zone of highway travel was vastly increased. This radical change in highway travel made absolutely essential that the crossing protection devices be standardized so that a highway traveler would know, wherever he might be—anywhere in the country, its message or purpose.

In 1930 the Signal Section of American Railway Association found that more than 60 various type of automatic crossing protection were in use. As a result of this study and the growing need for standardization and coordination between railroads and between railroads and public authorities, the American Railway Association in 1931 appointed a joint committee consisting of Operating, Safety, Engineering and Signal Section representatives for the purpose of developing national crossing protection standards. In November 1931 the joint committee issued its Bulletin No. 1—Railroad-Highway Grade Crossing Protection Recommended Standards—and distributed it to Federal and State governmental bodies and to other organizations interested, as well as to railroads. Bulletin No. 2, superseding Bulletin No. 1, was issued July 1935 in order to include the recommended practices. The recommended practices ~~as~~ set forth in these publications have generally been adopted or approved by the railroads, the Bureau of Public Roads, Department of Commerce, and State regulatory commissions having jurisdiction in such matters.

Bulletins Nos. 2, 3, 4, 5 and 6 were subsequently issued to incorporate the latest recommended practices for protection at railroad-highway grade crossings. Bulletin No. 6, issued in 1966, is now in effect, and copy of this Bulletin No. 6 is attached on page 28 of the exhibit.

All railroads operating within the State of Arkansas use the Association of American Railroads Recommended Practices for Railroad-Highway Grade Crossing Protection.

There are various types of crossing protection in service:

(1) Highway crossing signs as shown on page 29 of the exhibit (AAR Bulletin No. 6, Figure 1), a crossbuck sign with the words "Railroad Crossing", having reflecting material or buttons to improve night indication.

(2) Automatic signal devices which automatically indicate the approach of a train, and so controlled that they will operate for such period of time before the arrival of any train operated over the crossing as required to afford protection.

(a) A wig-wag signal, is shown on page 30 of the exhibit. This signal consists of a banner which swings to simulate the warning given by a watchman, a red light for night indication, a Railroad Crossing sign which identifies the crossing.

(b) Flashing light signals, are shown on page 31 of the exhibit (AAR Bulletin No. 6, Figure 4): This signal is the basic type of automatic protection in use. To this basic type of signal various adjuncts are added as specific characteristics at each crossing require.

The signals and signs are attached to a pipe post which is mounted on a concrete foundation. There are two flashing red electric units mounted 30 inches apart on a horizontal crossarm, generally attached to a mast 7 to 9 feet above the crown of the highway. Each light is alternately illuminated at a rate of 30 to 45 times per minute. Generally, the light units are installed "back to back" to provide an indication for the driver on both signal masts so that when the near signal is obstructed by a vehicle the back lights on the

opposite side of the tracks can be seen. There generally are four light units facing each direction along the highway.

These basic signals are supplemented with various other devices as required. These devices are: bells, additional light units; "NO RIGHT TURN", "NO LEFT TURN" signs; and automatic gates.

When gate arms are used, they extend only over the approach lane of the highway traffic, thereby providing an exit route for the vehicles which are on the tracks when the gates begin to lower. Highway crossing signals with gate arms are shown on page 32 of the exhibit (AAR Bulletin No. 6).

The statistics for crossing protection installations on the Missouri Pacific System and within the State of Arkansas are as follows:

	Bells	Wig-Wags	Manual Gates	Flagmen	Flashing Lights	Flashing Lights and Gates
1918						
M. P. Railroad	158	62	62	80	0	0
Arkansas	49	0	4	0	0	0
1930						
M. P. Railroad	158	203	57	77	100	0
Arkansas	51	23	7	0	21	0
1966						
M. P. Railroad	97	42	5	9	1,249	150
Arkansas	21	4	0	1	170	48

SIGNAL DEVICES.

Hot Box Detectors.

Hot box detectors were first installed on the Missouri Pacific Railroad during the year 1960. The purpose of this device is to observe each journal box on each car in a train as it passes, and indicate the amount of heat of

the journal on a tape of a graphic recorder located in a Dispatcher's, or yard, office for observation and necessary action to be taken when hot boxes or journals have abnormally high temperatures. This equipment when located in signal traffic territory permits the Dispatcher, or operator at the control machine, to stop the train and advise the train crew of the defective bearing and its location in the train. When a detector is located for inspection of train immediately prior to its arrival at a terminal point, the information from the tape recording is passed on to the yard inspection personnel. This avoids the need of "walking the train" and visually inspecting each journal box.

At the present time, there are five (5) hot box detectors on the Missouri Pacific Railroad and four (4) on the Texas & Pacific Railway. Three (3) of these detectors are located in the State of Arkansas at Little Rock and McGehee.

Dragging Equipment Detectors.

Dragging equipment detector is a safety device which detects any equipment dragging in a train below the level of the top of rail. This type of detector is used on the Missouri Pacific in advance of river bridges and interconnected with the signal system to automatically stop a train for inspection before passing over the bridge when any equipment is not clear of the detector. It is also being used in advance of our classification yards to check each car for equipment dragging before the car is placed in the classification yard for movement in a train. All of the automatic retarder yards on the Missouri Pacific are equipped with dragging equipment detectors. One is in service at the North Little Rock classification yard.

Broken Flange and Loose Wheel Detector.

The Missouri Pacific installed a broken flange and loose wheel detector in the North Little Rock Classification yard on December 20, 1963. The purpose of this detector is to check all wheels of cars before placing them in the classification yard for movement in train. This detector checks for broken wheels, broken flanges, loose wheels and for proper gauge between wheels. It is interconnected with the humping signal system which automatically stops humping operation by signal indication to the train crew. The Hump Conductor and Car Inspector are informed of the defect by a light indicator and buzzer alarm so they may make detailed inspection and proper action as required.

There are two of these detectors ~~in service~~ on the Missouri Pacific, one at North Little Rock and the other at Kansas City, at the classification yards.

Slide Detector.

Since 1930, the Missouri Pacific has installed a large number of slide detectors for protection of train movements from land slides at base of rock slopes or at entrance of tunnels. Should a slide occur due to falling rocks, snow or ice, falling trees or other foreign material and strike the detector in the protected area, it will cause the governing signal to automatically display a "Stop" indication. This detector provides twenty-four hour-a-day protection whereby a warning signal is displayed immediately when the slide occurs.

On the Missouri Pacific Railroad there are 25 locations with slide detectors in service; two of these locations are in Arkansas at Cricket and at Gleason.

High Water Detector.

A high water detector is a device interconnected with the automatic block signal system to stop trains when

high water conditions may result in impairment of the track or roadbed. It is employed in such a manner that when water reaches a certain stage, generally one foot below base of rail during flash floods, or high water, the signals protecting the track will display their most restrictive indications, and will continue to display this indication until the detector is restored to its normal position manually after repairs have been made or track is found safe for passage of trains.

On the Missouri Pacific, there are 39 high water detectors; three are located within the State of Arkansas at Cricket and at Holland.

CONCLUSION.

Signaling and signal devices were first devised to improve train safety; during and after the depression years of the 1930's and the World War II years of the 1940's, signaling was primarily advanced for greater efficiency, economy and safety. Since World War II, many technological improvements have been made in all types of signal systems, interlocking plants, crossing protection and other safety devices. All of these improvements in systems and devices have not only increased safety and efficiency of train operation, they have materially reduced the work load of operating personnel who direct the movement of trains, and work load of train crews handling the trains.

Power operated switches controlled from CTC machines, interlocking plants and stations have avoided the need for stopping trains for crews to hand-throw these switches except as required in emergency or for some switching movements. This has resulted in decrease in personal injuries, property damage such as pulled out draw-bars, broken knuckles, shifted lading, etc., which are attributable to train stops and train handling.

Moving trains by signal indication has resulted in a smoothly functioning railroad, keeping the trains in motion a greater portion of time, permitting trains to clear main tracks for operation of other trains and has reduced the number of written train orders, avoiding the possibility of human error in transmission, interpretation and execution of written orders. This has also permitted the men who are responsible for the operation and direction of train movements to devote more of their attention to better train movements. Furthermore, the work load of train crews has been reduced in both automatic block and traffic control territory with the recent revision of Operating Rule 99 (j) which has eliminated flagging requirements for rear end protection when a train or engine is standing on a main track with at least two automatic block signals to the rear.

The various types of signal systems, interlocking plants, crossing protection and other devices are of general standard type used on all American railroads. These modern methods of signaling and devices are presently being used by major railroads operating within the State of Arkansas.

INTERVENORS' REBUTTAL EXHIBIT NO. 27—

Cross-Examination,

By Mr. Ross:

Q. State your name and address, please, sir. A. Charles T. Marak, Missouri Pacific Building, St. Louis, Missouri.

Q. And you are the signal engineer for that railroad? A. I am.

Q. For the Missouri Pacific Railroad? A. Yes.

Q. Mr. Marak, on page 5 of your testimony at the bottom of the page you state that "All major Missouri Pacific, primary main lines within the State of Arkansas have traffic control signalling". Are you referring there to centralized traffic control signalling? A. That's right.

Q. And this is the line from the Missouri border, the run from Poplar Bluff to Texarkana? A. That is right.

Q. That goes through Arkansas? A. That is right. It is cities shown in the exhibits on the plans.

Q. And the territory of the line from Little Rock to Wilmot, Arkansas, I believe? A. That is right.

Q. Is also CTC? A. Yes.

Q. Missouri Pacific also has some automatic block territory? A. Yes, sir, it does.

Q. And some territory which is referred to as "dark railroad territory"? A. That is correct.

Q. The use of centralized traffic control does not eliminate the use of all type of train orders, does it, Mr. Marak? A. It does not. There may be some train orders for slow orders et cetera, but not all train orders.

Q. These are form ex-train orders? A. Well, I believe that is what they call them.

Q. It is not unusual for these train orders to be issued on CTC territory, is it? A. No, it is not uncommon, I would put it that way.

Q. On page 8 of your testimony, you define or set out the American Association of Railroads definition of automatic block signal system, and in that definition cab signals are referred to. Missouri Pacific does not have any operating cab signals in Arkansas other than the hump engines in North Little Rock, do they? A. That's correct.

Q. The hump engines in North Little Rock are equipped with a type of cab signal? These are radio operated, are they not? A. No, they are inductive type but we do have radio in the cab as well as the cab signal.

Q. On page 9 of your testimony, you refer to in the paragraph at the bottom of the page, you state that "selected passing sidings in the territory are equipped with power operated control switches and associated signals". How are these passing sidings so equipped selected or selected to be so equipped? A. Well, it depends on the amount of traffic and various other conditions, operating conditions determine where you put a

siding to meet and pass trains. There may be instances where they are ten miles apart or 15 or 20. It depends on the traffic density.

Q. There are sidings on CTC or on the CTC portion of your railroad which are not equipped with power controlled switches, are there not? A. Not the sidings where we meet the passing of trains except where they are electrically locked but then there are industrial tracks but not designated in the time tables as sidings.

Q. Further down in that paragraph you refer to absolute blocks and state "by absolute I mean that only one train at a time may occupy the block". When a train has an absolute block signal and stops for that signal and the crew is unable to contact the CTC operator or dispatcher, may that train then proceed under flag protection? A. He may with flag protection, yes, only.

Q. Mr. Marak, will a light engine of one car activate the block signal on CTC or ABS railroad? A. Yes. There are some instances where we have short engines we are required to take an additional car with it to make sure it doesn't span dead sections of the territory.

Q. Mr. Marak, have you had any instances on the Missouri Pacific railroad in Arkansas, that portion which is CTC controlled, where a false clear signal has been given or indicated? A. Yes.

Q. So CTC territory or CTC equipment is not entirely fail safe? A. Yes, it is recognized by the Bureau of Safety as being a fail safe system. Now, if you are talking about the control machine as referred to in my statement, there is no fail safe equipment in the control machine itself. It is all in the field and it is all automatic as required by the Interstate Commerce Commission Bureau of Safety.

Q. I understood you to say, Mr. Marak, that there have been instances in which a false clear indication has been given. Now, this doesn't appear to be fail safe to me. Am I misunderstanding you? A. No. In the past ten

years, since 1957 to 1966 inclusive, we have had seven false proceed signals on the railroad, the Missouri Pacific, and that is a ratio of 1 to 73 million 644 thousand signal operations and so the answer to your question it is very remote.

Q. False clear signals do occur though? A. They occur, but as I have stated, they are very remote.

Q. Have any of these false clear signals which you referred to resulted in accidents? A. Reportable accidents, as reported by the Interstate Commerce Commission, in the past 20 years, I have reviewed the record, do not indicate that one of them has been because of false proceed signals; however, there has been equipment that has failed because of malfunction with minor damage to equipment.

Q. In those seven instances that you referred to in Arkansas on your railroad where there has been a false clear indication, none of those resulted in an accident? A. They did not.

Mr. Light: Mr. Ross, I think you misunderstood him. The seven instances were Missouri Pacific's systemwide instead of just in Arkansas.

The Witness: That is correct, systemwide.

By Mr. Ross: Q. Were any of those in Arkansas? A. No.

Q. Have you had any instances in Arkansas in which the automatically controlled switches at sidings have not operated properly? A. Do you mean false restricted because of rock in the points or for some other reason.

Q. No, sir. A. I don't understand your question.

Q. All right. Has there been any instances of a false clear signal indication appearing and the automatically controlled switches not been properly aligned? A. Not with a train present.

Q. But they have occurred? A. They have occurred.

Mr. Light: I think we are now referring to Exhibit page 17.

By Mr. Ross: Q. Mr. Marak, between January 1, 1966

and March 15, 1966, was any part of your CTC track or CTC signal equipment on the track removed? Let me ask the question this way: Does the Missouri Pacific in Arkansas still have 563 miles of CTC track, CTC governed track? A. I would have to look at the exhibit. In my testimony I referred to as of January 1, 1966.

Q. Yes, sir, that is on page 15 of your statement, I believe. A. Since that time, we have prepared another exhibit as of January 1, 1967, on the Missouri Pacific proper, excluding the Texas District, we have 1764 miles of track of CTC in the system.

Q. How many in Arkansas, Mr. Marak? A. It would be the same as that shown on my statement, on sheet 15 or 563 miles of track.

Q. Mr. Marak, in response to a request of documents made by the Intervenors, the Missouri Pacific Railroad Company furnished us with a map showing the centralized traffic control and ABS territory in Arkansas. The map is dated March 15, 1966 which is subsequent to the map in your Exhibit. The number of miles of CTC indicated as 551, which is less than indicated on your Exhibit. The number of miles of automatic block signal on tracks so equipped is indicated as 242.2 miles which is less than indicated on your Exhibit of January 1, 1966. I hand you this map. Do you see the mileage indications which I have referred to? A. Yes.

Q. Were those mileage indications correct as of March 15, 1966? A. The statement that I made in mine is the one that we submitted to the Interstate Commerce Commission and I do not know whether they conflict with these or not.

Q. Do you see on the map which I have handed to you an indication as to the number of miles of track which are controlled by CTC? A. Yes.

Q. That figure does conflict with the figure which you have indicated in your statement and in your map? A. It does.

Q. At page 17 of your Exhibit, does it not? A. It does.

Q. The mileage indicated for automatic block signal controlled track also conflicts with the figure which you have indicated in your statement at page 15 and your map at page 17 of your Exhibits, does it not? A. It does, but I call your attention that they are of two different dates and I am not aware that there have been any changes since January 1 of 1966 to March 15, 1966.

Q. The map which I handed you is dated on what date, Mr. Marak? A. March 15, 1966 and the Exhibit that I referred to is of January 1, 1966 or the last day of the year, 1965. Now, I might add that we were in the process of extending our CTC on the Little Rock to McGehee at that time and it is possible that that is because of the variation in figures.

Q. The map which I have handed you which indicates fewer miles controlled by CTC and ABS is dated subsequent to your Exhibit or the date from which you took your figures for your Exhibit? A. Yes. We have installed some CTC between East Little Rock and McGehee where there were no signals in service.

Q. If you were installing CTC signals at the time of your Exhibit, January 1, 1966, then a map dated March 15, 1966 should have shown some additional miles controlled by CTC rather than fewer miles, should it not? A. This is March that you are talking about, March 16, 1966. We are talking about the end of 1965 which is three months hence.

Q. Mr. Marak, on page 15 of your statement, you indicate that these are signal statistics as of January 1, 1966. A. That's right.

Q. The map which I handed you is dated March 15, 1966 which is a later map or supposed to be a later map. Is that correct? A. That is correct.

Q. And shows fewer miles controlled by both CTC and by ABS than does your Exhibit? A. At the present I can't account for it but the map that I have submitted in

my testimony agreed with the report made to the Interstate Commerce Commission which we made annually on the last day, the end of the year.

Mr. Ross: I will submit this map that is dated March 15, 1966, as Intervenor's Exhibit No. 1 to Mr. Marak's testimony on cross-examination.

By Mr. Ross: Q. Mr. Marak, at an automatic inter-locking, if the signals on the conflicting routes do not indicate stop, then flag protection must be provided on those conflicting routes? A. If a time release has been operated to determine if the conflicting route signals are stop—we have a rule covering that.

Q. Yes, sir. After the time release has been operated and the signals on the conflicting route still indicates stop, then flag protection must be provided on that conflicting route in both directions, does it not? A. Unless it is known that these signals on the opposing route are at stop or in the stop position.

Q. But if those signals are not in the stop position, then flag protection must be afforded in both directions on the conflicting route? A. That's correct.

Q. Mr. Marak, are any of the CTC or automatic block signals located on the fireman's side of the track rather than the engineer's side? A. Yes, we had some instances.

Q. From time to time these signals will still be installed at the present time, new signals will be installed on the fireman's side rather than the engineer's side won't they? A. If granted by the Interstate Commerce Commission and Bureau of Safety to do so. We have to file applications with the Commission for this permission.

Q. The Missouri Pacific does from time to time file application and receive permission to put signals on the fireman's side in Arkansas, don't they? A. They do.

Q. Mr. Marak, do you know how many public crossings, railroad with highway, there are on your railroad in Arkansas? A. I believe I have so indicated in one of my, in my statement.

Q. I see where you have indicated the number protected crossings. I don't recall seeing the number of total crossings. A. To answer your question, I do not know offhand.

Q. Mr. John H. Lloyd of Missouri Pacific Railroad Company has indicated in answer to an interrogatory that as of January 1, 1966, there were 1,747 grade crossings, railroad with highway. Would you accept that figure as being correct, Mr. Marak? A. If Mr. Lloyd has made the statement, I would accept it, yes.

Q. And I believe you indicate in your Exhibit that some 240 crossings are protected? A. That is correct.

Q. Mr. Marak, you have indicated that there is a dragging equipment detector and a broken phlange and loose wheel detector located at the North Little Rock classification yard. Are these the only two or is this the only location in which such detector devices are located in Arkansas? A. That is correct.

Q. Mr. Marak, all cars operated in Arkansas do not move through the classification yard at North Little Rock, do they? A. I do not think so.

Q. Mr. Marak, was an incident reported to you concerning a siding at Emmett, Arkansas, about 1962 or '3 in which an automatic, automatically controlled switch was not aligned for movement on the main line although a clear indication was given for movement on the main line? A. It was so reported and investigated, and we found no facts or no evidence of that.

Q. There were statements made to that effect by members of the crews? A. That is correct. They made such statements.

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Redirect Examination,

By Mr. Light:

Q. Mr. Marak, yesterday did you call my attention to the typographical error on page 17 of your Exhibit? A. Yes.

Q. Would you correct that for the record now? A. In

my statement on page 25, I indicate there are 240 crossings protected in the State of Arkansas. On Exhibit 17, it is shown as 243. This should be revised to indicate 240.

* * * *

By Mr. Light: Q. Referring, Mr. Marak, to the discrepancy between the January 1, 1966 and March 15, 1966 signal maps, during that period was any construction going on in Arkansas on the Missouri Pacific that would affect the amount of CTC and ABS control mileage? A. Yes. We were in the process of installing traffic controls and making various adjustments.

Q. And are you familiar with any lines that Missouri Pacific abandoned during that period that would affect these statistics? A. The Hot Springs branch was abandoned but I don't recall whether it involved the CTC.

Q. Was there any reconstruction around the Dardanelle Reservoir?

Mr. Ross: I object to that as being a leading question.

The Witness: At the Dardanelle Reservoir there were automatic blocks and not CTC.

By Mr. Light: Q. Was there any reconstruction around the Dardanelle Reservoir? A. There was.

Mr. Ross: I object on the grounds that it is a leading question.

The Witness: The mileage of track was shortened because of the line change.

By Mr. Light: Q. Mr. Marak, in these statistics that you have given on ABS and CTC, the number of miles controlled by those systems, if you have a double main line track, do you count in these statistics both sets of tracks in the aggregate or do you count it—I have gotten very awkward in my question and I don't know the answer to this, but I am seeking it. If you have 10 miles of double main line track and it is CTC territory and both tracks are controlled by the CTC's system, do you count that in your CTC system as 10 miles or 20 miles? A.

We report it both ways to the Interstate Commerce Commission.

Mr. Ross: I object to that because it——

The Witness: We report both ways to the Interstate Commerce Commission by miles of track and by miles of road. If it is double track in miles of track we count it as miles of track, but in miles of road, we do not, but these statistics that I have shown are the statistics filed with the Bureau of Safety of the Interstate Commerce Commission and that is as I have stated before as of the 1st of January.

Mr. Ross: I objected on the grounds that it was a leading question and then I object to the comment made by Mr. Light.

By Mr. Light: Q. On page 17 of your Exhibit where you reflect 563 miles of CTC which way is it reported, counting it in miles of track or miles of line? A. What page is that?

Q. Page 17 of your Exhibit. A. That's miles of track.

Q. Do you know whether during the period between these two maps there was any double main line that was reduced to single main line in Arkansas? A. Well——

Mr. Ross: I object to that as being a leading question.

The Witness: I do not recall at the moment.

* * * *

Cross-Examination,

By Mr. Lessenberry:

Q. Mr. Marak, I am a little confused about your reported failures of the clear signals. I understood your response to Mr. Ross' cross-examination that there had been seven reported failures on the entire Missouri Pacific system and none in Arkansas? A. That's right.

Q. And then he asked you about a particular instance that had been reported that you said the Missouri Pacific investigated but found no substance or foundation to it. Is that correct? A. That's right.

Q. Well, then your reported failures that you referred

to are those that were reported to the railroad company, that the railroad company found no substance or foundation to the report? A. That is right. In other words, if there is such a fact that there was a failure we have to report that to the Bureau of Safety each month.

Q. And you necessarily investigate all of them? A. We do, that is, not all false restrictive but all false proceeds we do and the Bureau of Safety also has inspectors that review the case.

Q. Then would it be valid to presume that there had been more reported failures but only seven substantiated to the satisfaction of the Missouri Pacific? A. There were seven classified as false proceed and reported to the Bureau of Safety and all seven have been investigated by their Commission's inspector and verified.

Q. I further take it of course you are not testifying from your own knowledge about these failures, but only those reported to railroad management? A. I don't get the question.

Q. I am suggesting that there may have been failures that were not reported? A. Oh, it is possible.

Q. You made note of the number of public grade crossings. Do you have any idea of the number of private crossings in Arkansas? A. I have no idea.

Q. Can you tell me if any of those private crossings would be protected with other than maybe your crossbars? A. Yes, we have certain instances—I don't recall one in the State of Arkansas, but we have protected them for private industries.

Q. Do I understand that these signal devices fall generally into the category of flashing lights, bell or arm? A. They fall generally in the category of flashing lights, wigwag, bells, flashing lights and gates.

Q. Does your office ever receive petitions or requests from officials of private individuals to establish one of these automatic signal devices at a crossing where there is none? A. Yes, many instances.

Q. And frequently are these requests denied? A. Yes, they are denied occasionally.

Q. Do, in fact, some of your grade crossing accidents occur at places where you have installed one of these rare signal devices? A. Yes. We have accidents at flashing light installations.

Q. Of the three categories that you mentioned, is the lowering arm or gate the most effective? A. Not necessarily. In certain places it may be.

Q. The cheapest of those devices for installation and maintenance is the bell system? A. The bell system is the cheapest but it is going out of the picture very rapidly and we are not installing any bells as such.

Q. Do you have any idea of what percentage of the controlled or signal public crossings in Arkansas are bell at this time? A. I have made a statement on page——

Q. Mr. Light has shown it to me at page 25, sir. A. There we show 21 bells. In 1930, we had 51 and so we are gradually reducing them and we will eventually eliminate them.

* * * *

[Exhibit to Cross-Examination Omitted From Appendix.]

PLAINTIFFS' EXHIBIT NO. 28—
Exhibits to Testimony of Charles T. Marak.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 29—
Testimony of B. J. Alford.

INTERVENORS' REBUTTAL EXHIBIT NO. 29—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 30—
Testimony of William E. Laird.

INTERVENORS' REBUTTAL EXHIBIT NO. 30—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 31—
Testimony of F. R. Malott.

INTERVENORS' REBUTTAL EXHIBIT NO. 31—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 32—
Testimony of W. J. Lacy.

My name is W. J. Lacy. I am Superintendent of St. Louis Southwestern Railway Company (Cotton Belt) with headquarters at Pine Bluff, Arkansas. I have served in this capacity since June 1, 1965. I am responsible for all phases of train and yard operations of the Cotton Belt, which operates in the states of Illinois, Missouri, Arkansas, Texas, Louisiana and Tennessee. This includes 1,540 miles of primary and branch line main track, of which 502 miles, approximately one-third, are in Arkansas. The state of Arkansas is in the center of Cotton Belt's operation and its principal operating office and principal switching yard are maintained at Pine Bluff, Arkansas. There are 11 switching yards on the Cotton Belt where yard engines are assigned, working approximately 26,544 engine days per year. A map of the Cotton Belt is attached to my statement as Exhibit A.

I have been an operating officer of the Cotton Belt for 13 years. My prior service includes nine years as Telegrapher, Dispatcher and Night Chief Dispatcher; seven years as Trainmaster, four on the Texas subdivision and three on the Pine Bluff subdivision; three years as Assist-

ant Superintendent of the Jonesboro subdivision, and two years as Assistant General Superintendent with headquarters at Pine Bluff, Arkansas.

The Cotton Belt was a party to the proceedings which resulted in the Award of Arbitration Board 282 rendered November 26, 1963. In May 1964, Cotton Belt placed in effect Section II of the Award of Arbitration Board 282, which authorized the elimination of firemen from freight and yard engines. Pursuant to this Award, except for nine firemen assignments in freight service and six in yard service, which were vetoed by the Brotherhood of Locomotive Firemen and Enginemen under the ten percent veto provisions of the Award, the Cotton Belt has eliminated all fireman assignments in freight and yard service, which were wholly within the other five states in which it operates, none of which have crew consist laws requiring a fireman or third brakeman. There are no firemen working on the Cotton Belt under the attrition provisions of the Award.

Insofar as operations in Arkansas are concerned, the veto provisions of the Award have been complied with and the Brotherhood of Locomotive Firemen and Enginemen have designated seven firemen assignments in freight service and two in yard service in Arkansas as veto jobs. All of the remaining fireman assignments in freight and yard service in Arkansas could and should be eliminated as they have been in all other states in which we operate, but because of the Arkansas Statutes, we have been compelled to retain them.

Concerning the use of a third brakeman in train service and a third helper in yard service, Cotton Belt, for the past 22 years, of my own knowledge, and I understand since at least 1892, has operated its through freight trains in states other than Arkansas with train crews consisting of a conductor and two brakemen and most of its yard engines with yard crews consisting of an engine foreman and two helpers. Because of the provisions of longstanding labor

contracts with the Brotherhood of Railroad Trainmen, most local trains and some yard engines were operated with a conductor and three brakemen, or an engine foreman and three helpers.

Cotton Belt utilized the provisions of Section III of the Award of Arbitration Board 282 relating to the consist of crews in train and yard service to reduce the size of the crews on all of its local train and yard engine assignments in states other than Arkansas to a conductor and two brakemen, or a foreman and two helpers. This was authorized by an award rendered on July 14, 1964, by Special Board of Adjustment constituted under Section III of the Award of Arbitration Board 282 with Mr. Frank Elkouri as neutral member. Copy of Cotton Belt's proposal and of the award sustaining it are attached to my statements as Exhibits B and C, respectively. Since July-August 1964, except for three third helper assignment in the Waco, Texas yard, all third brakemen and third helpers have been eliminated from all train and yard engine crews which operate wholly outside of Arkansas. The three helpers working at Waco as third helpers are doing so by virtue of the attrition protective provisions of Award of Arbitration Board 282. Attrition will eventually eliminate the assignment of third helpers to these three yard engine crews.

Concerning the consist of train and yard crews in Arkansas, solely because of the Arkansas Statutes, we are compelled to assign a third brakeman or helper to all of the trains and yard engines we operate in Arkansas except on dodger and an occasional local, when operated with less than 25 cars, and 18 yard engine assignments at the Pine Bluff yard, which do not operate over public street crossings within city limits. Were it not for the Arkansas Statutes, the third brakeman or helper could be eliminated from all or our crews in Arkansas, as they have been in all of the other states in which we operate.

The assignment of a third brakeman to the crews of

main line locals and a third helper to some yard engine assignments in Arkansas is covered by labor contracts with the Brotherhood of Railroad Trainmen, as it was in states other than Arkansas. Cotton Belt has utilized the provisions of Section III of the Award of Arbitration Board 282 to reduce the size of these crews as it did to reduce the size of such crews in states other than Arkansas. A Special Board of Adjustment was constituted with Mr. Charles W. Anrod as neutral member. Before hearings could be held, the two-year period specified in the Award of Arbitration Board 282 expired and the Brotherhood of Railroad Trainmen brought suit to enjoin further proceedings, contending the Special Board of Adjustment no longer had jurisdiction to act. It is Cotton Belt's contention that the Special Board, having been duly constituted before the two year period expired, does have jurisdiction to hold hearings and render an award. Decision of this issue is pending on appeal to the United States Circuit Court of Appeals for the District of Columbia Circuit.

The number of trains and yard engines operated by Cotton Belt fluctuates somewhat from time to time, depending on the volume of business, but generally Cotton Belt operates an average of 28 main line through freight trains daily between cities on its system (eight between East St. Louis, Illinois and Corsicana, Texas; four between East St. Louis and Pine Bluff, Arkansas; two between East St. Louis and Shreveport, Louisiana; four between Pine Bluff and Shreveport; six between Pine Bluff and Memphis, Tennessee; two between Pine Bluff and Dallas, Texas, and two between Pine Bluff and Fort Worth, Texas). These trains each operate over from one to six operating subdivisions, on each of which there is a complete crew change. Because of this, approximately 96 operating crews are required to man these trains. Every one of these trains is either operated through, into or out of Arkansas. With the sole exception of the nine vetoed

fireman assignments, all of these trains while operating over divisions wholly outside of Arkansas are manned by 4-man crews, consisting of an engineer, conductor, head brakeman and rear brakeman. Because of the requirements of the Arkansas Statutes, the same trains, while operating over divisions wholly or partially within Arkansas, are manned by 6-man crews, consisting of an engineer, fireman, conductor, head brakeman, rear brakeman and third brakeman. All of these trains can be operated just as safely without a fireman and third brakeman as with them, and, except for the nine vetoed fireman jobs, we have eliminated the fireman and third brakeman from the 42 crews which operate these trains daily over subdivisions wholly outside of Arkansas, but, solely because of the Arkansas Statutes, we are compelled to maintain them on 54 crews which operate trains daily on subdivisions wholly or partially in Arkansas.

Neither a fireman nor a third brakeman are required by law in Missouri or Louisiana. We have no terminals at the Arkansas state border with these states and, in order to comply with the Arkansas Statutes, we are compelled to assign a fireman and third brakeman to many of our trains while in Missouri and Louisiana even though this is not required by the law of those states. Four daily through freight trains each operate between Shreveport, Louisiana and Pine Bluff, Arkansas, a distance of approximately 38 miles in Louisiana and 151 miles in Arkansas. A fireman and third brakeman are on duty on the entire run. Fourteen daily through trains operate between East St. Louis, Illinois and Jonesboro, Arkansas. The seven southbound trains are operated with two brakemen from East St. Louis to Malden, Missouri, where a third brakeman is added to ride to Jonesboro, Arkansas, a distance of approximately 10 miles in Missouri and 57 miles in Arkansas. Usually the sole reason the train is slowed (or stopped) at Malden is to take on the additional brakeman. The same procedure is employed on the seven northbound

trains with the third brakeman boarding the train at Jonesboro and leaving it at Malden. Except for two veto fireman assignments under the Award of Arbitration Board 282, these trains are operated without a fireman from East St. Louis, Illinois to Illmo, Missouri. Because there is no terminal for firemen between Illmo and the Arkansas state line at which a fireman can be added, we are compelled to add a fireman at Illmo who rides to Jonesboro, Arkansas, a distance of approximately 74 miles in Missouri and 57 miles in Arkansas. The same procedure is employed in the opposite direction with the fireman boarding the train at Jonesboro, Arkansas, and leaving it at Illmo, Missouri.

We operate two local trains wholly in Missouri and fifteen wholly in Texas, all with only 4-man crews. We operate thirteen locals wholly in Arkansas, four locals between Missouri and Arkansas, and one local between Louisiana and Arkansas. Because of the Arkansas Statutes, seventeen of the eighteen locals operating wholly or partially in Arkansas are operated with 6-man crews. One, the Pine Bluff Arsenal Dodger, is operated with a 4-man crew because it does not handle more than 25 cars and is thus exempt from the Arkansas Statutes. In order to comply with the Arkansas Statutes, we are compelled, as in the case of through trains, to assign a fireman and third brakeman to local trains while operating in Missouri and Louisiana where a fireman and third brakeman are not required by law. One local train operates daily, except Sunday, from Shreveport, Louisiana, to Texarkana and return, with a total run of approximately 76 miles in Louisiana and 108 miles in Arkansas. Two local trains operate daily, except Sunday, between Illmo, Missouri and Jonesboro, Arkansas, a distance of approximately 74 miles in Missouri and 57 miles in Arkansas. A fireman and third brakeman are on duty on the entire run of each of these locals.

We are operating 42 yard engine assignments daily in yards at East St. Louis, Illinois; Illmo, Missouri; Shreve-

port, Louisiana, and Dallas, Hodge, Tyler and Waco, Tyler and Waco, Texas. These are all manned by 4-man crews, consisting of an engineer, engine foreman and two helpers, except for six vetoed fireman assignments in Illinois, Missouri and Texas and three third helper assignments at Waco being filled because of the attrition provisions of the Award of Arbitration Board 282. The yard engine assignment at Illmo, Missouri, is being operated with only one helper because the work is light and two helpers are not needed. We operate 32 daily yard engine assignments at Pine Bluff, Jonesboro, Little Rock and Texarkana, Arkansas. Under the Arkansas Statutes, we are compelled to man fourteen of these with 6-man crews consisting of an engineer, fireman, engine foreman and three helpers because they operate over city streets. The other eighteen assignments, all at the Pine Bluff yard, which is outside the city limits of Pine Bluff, are exempt from the Arkansas Statutes because they do not operate within city limits and, therefore, we are operating these assignments without a fireman and third helper. Included within the fourteen assignments manned with 6-man crews in Arkansas are six yard engines operated daily at Texarkana, which perform most of their work in Texas where neither a fireman or third helper are required by law, but, because they are subject to performing work in Arkansas, a fireman and third helper are assigned to these yard engines at all times.

The data shown on Exhibit 42 concerning the operation of specific trains, as explained in the statements of the officers who rode them, is characteristic of our daily train operations. The eight trains we operate between East St. Louis and Corsicana, Texas, are through trains operated in coordination with the Southern Pacific Company, between East St. Louis and Los Angeles, California, a total distance of 2,452 miles. The entire trains, including the locomotives and cabooses, are interchanged with the Southern Pacific at Corsicana, Texas. Except for two veto

fireman assignments, these trains are operated between East St. Louis, Illinois and Illmo, Missouri, a distance of 125 miles, with a 4-man crew. Because of the Arkansas Statutes, they are operated between Illmo and Texarkana, a distance of 425 miles, with a 6-man crew. Except for veto fireman assignments, they are operated between Texarkana and Los Angeles, a distance of 2,047 miles, without a fireman. They are operated between Texarkana and El Paso, a distance of 1,005 miles without a third brakeman. Between El Paso and Los Angeles, a distance of 817 miles, a third brakeman is not required by law, but is assigned to portions of the run under an attrition labor agreement. Attrition will eventually eliminate the third brakeman from all portions of the run between El Paso and Los Angeles.

On modern diesel locomotives, the fireman has no necessary functions other than to keep a lookout and call signals to the engineer. Both of these functions have been safely and adequately performed by the head brakeman during the two years we have been operating trains outside of Arkansas without a fireman. As demonstrated on Exhibit 42, there are few engine malfunctions and about 90 percent of these merely involve ground relay action. This is a safety device designed to reduce the load from the electric traction motors when a short or ground of any kind occurs. A slight quick jar will cause the relay switch to trip. When the relay switch is tripped, an alarm bell sounds in the control unit. In most cases, the unit can be reactivated by merely pressing the reset button on the unit involved. When a fireman is aboard, he performs this function, and when he is not aboard, this function is safely performed by the engineer who stops the train and performs it himself. A number of our newer engines are equipped with a reset button located near the engineer, which he can use to reset the ground relay switch on any unit in the locomotive consist. This enables the engineer to reactivate a trailing unit without stopping the train.

Centralized traffic control on the primary main line has eliminated the necessity for flagging when trains are stopped. Any flagging required on branch lines can be safely and adequately performed by the conductor and two brakemen on a 4-man crew. The third brakeman on a 6-man crew performs no work or function which cannot be safely and adequately performed by the conductor and two brakemen on a 4-man crew.

The cost to the Cotton Belt of maintaining a fireman and third brakeman or helper on its trains and yard crew in Arkansas was approximately $2,198,954 in the year 1965. There is no significant difference in the operation of our trains and yard engines in Arkansas as compared to their operation in other states which affords any justification, safety or otherwise, for the use of a fireman or third brakeman or helper in Arkansas. The locomotive and car consist of the trains does not change when they pass over the Arkansas border. The signaling, equipment, terrain, the method of operation and the work are essentially the same over our entire railroad. The only change is in the size of the crews. As I have heretofore explained, since shortly after the Award of Arbitration Board 282 about two years ago, we have been safely conducting our train and yard service operations outside of Arkansas without a fireman or third brakeman or helper. This is approximately one-half of our overall operation. The other one-half is in Arkansas and I know that our operations in Arkansas can be conducted without a fireman or third brakeman or helper just as safely as they have been and are being conducted in Illinois, Missouri, Louisiana and Texas.

INTERVENORS' REBUTTAL EXHIBIT NO. 32—

Cross-Examination,

By Mr. Ross:

Q. State your name and address, please, sir? A. W. J. Lacy, 3909 Holly Street, Pine Bluff, Arkansas.

Q. And you are the superintendent of the St. Louis-Southwestern Railway Company? A. That is correct.

Q. What are your duties as superintendent? A. My duties as superintendent of the Cotton Belt is to plan, organize and direct the operation of the Cotton Belt Railroad from East St. Louis to Dallas, Fort Worth, Corsicana, Shreveport, all the operations of the Cotton Belt which include train operations, switching operations and all related duties thereto.

Q. As superintendent of the Cotton Belt, do you have any responsibilities in regard to the operations of the Southern Pacific Railway? A. Only to the extent that in certain yards such as Shreveport and Dallas and Waco we operate jointly with the Southern Pacfic as the operating carrier and we control the functions at these joint facilities.

Q. Mr. Lacy, by agreement with the Brotherhood of Railroad Trainmen, the Cotton Belt maintains a train crew of conductor and three brakemen on all main line locals in Arkansas? Is that correct? A. That is correct.

Q. Are there also some main line locals in Missouri which are manned by a crew of conductor and three brakemen? A. Yes.

Q. Mr. Lacy, did you instruct the road foremen and trainmasters and assistant trainmasters as to or in regards to the study which was conducted in the Summer of 1966 the results of which are reported in Exhibit 42? A. Yes, sir.

Q. What were the instructions that you gave to those personnel? A. They were instructed to ride certain trains with a view of particularly observing the function of each crew member on the train that they rode.

Q. Were these supervisory personnel provided with forms to fill out which are requesting the information that you wanted concerning these runs? A. I believe that they do. I don't recall having studied the form and I don't remember offhand the contents of the information that

was required but I am sure there was a form to be filled out.

Q. Did you choose the particular runs on which each of these supervisory personnel were to ride and report on? A. Not the particular runs but an effort was made to diversify the operation if possible which included through freight trains and locals.

Q. Were the supervisory personnel instructed as to the number of through freights on which they were to ride, the number of local trains on which they were to ride? A. This entire project, as far as the selection of trains, was carried out through my staff at Pine Bluff. I do know that they had a starting time and an ending time to accumulate the data; however, I did not personally determine the starting nor the ending time. This was carried out through my staff at Pine Bluff.

Q. Were the supervisory personnel instructed as to the number of through freight trains to be ridden and the number of local freight trains to be ridden or do you know? A. The instructions were issued by our assistant superintendent, Walton, over my general supervision and I am not aware of the explicit instructions issued by him.

Q. Exhibit 42 reflects that, according to my count, supervisory personnel rode on a total of seventy through freight runs and six local freight runs. Is this representative of the total of each type or class of run operated by the Cotton Belt? A. Do you mean the correlation between the percentage of the trains that were actually ridden as to the trains actually operated, do these percentage reflect that this would be a pro rate of the types of services as operated by the Cotton Belt?

Q. Are the runs reported on in Exhibit No. 42 representative of the total operation of the Cotton Belt Railroad? A. I would say that the trains ridden by the supervisory personnel would be representative of the trains operated daily on the Cotton Belt, yes.

* * * *

Q. Were a proportionate number of locals ridden or would the number of locals ridden bear the same proportion or percentage as would the number of through freights ridden to the total operations? A. No.

Q. Of the through freights which were ridden by supervisory personnel, do you know how many or what is referred to as "expedited trains" and how many are through freights other than expedited trains? I am just asking you if you know, Mr. Lacy? It is not necessary for my purposes that you go to and give me the exact number unless you know already. A. This information can be obtained from Exhibit 42 very readily; however, without analyzing this exhibit with a view of determining the percentages requested by you, I am unable to state offhand the exact percentage.

Q. Are there expedited trains designated by including an X in the number or letter designation of that train? A. Not on this report.

Q. Are they usually so designated on the timetable? A. No.

Q. Are these trains operated by timetable? A. Not all of them, no.

Q. Are all of the trains designated on Exhibit 42 by letters rather than numbers expedited trains? A. All of the trains shown in Exhibit 42 designated by letter are in a sense expedited trains. Some of these trains designated by letter are, of course, given priority over other trains also designated by letter.

Q. Is it your testimony then that all of the trains designated by letter are expedited trains and that some of them have priority, some of the letter trains have priority over other letter trains? A. This is true, yes.

Q. Over other letter designated trains? A. Yes.

Q. Are the through freight trains designated on Exhibit No. 42 by numbers other than expedited trains? A. No. There are several trains designated by number that are considered as being expedited trains.

Q. Regarding trains operated on the Cotton Belt, what are expedited trains? A. We attempt to expedite all of our trains on the Cotton Belt because some of the schedules are set up to afford less time between origin points and destination points. Some of the trains, by virtue of the close operating schedule are given priority over trains that have more time allotted between origin and destination points on the schedule.

Q. Does the Cotton Belt run some trains which are referred to, some through freight trains which are referred to as pick-up trains or dead freight trains? A. Yes.

Q. Are any of the trains referred to in Exhibit 42 of this classification, that is, pick-up trains or dead freight trains? A. Are there only four sheets of this exhibit?

Q. Four? A. There are no pick-up or set-out trains or trains designated as dead freights on sheet 1, nor sheet 2, nor sheet 3. On sheet 4 there are three trains in the category of through freight trains that could be considered as pick-up and set-out trains. These are trains, train 318 on the dates of July 5th and July 6th, 1966.

Q. Do the terms "pick-up train" and "dead freight train" refer to the same class train, same type on your railroad? A. Actually we have no designation for pick-up trains as such. We do operate some trains that do pick-up and set-out work.

Q. Well, these trains that do pick-up and set-out work, are they also referred to as dead freight trains on your railroad? A. Actually we only have one train that is designated as a dead freight south of Pine Bluff and an irregular train north of Pine Bluff that are referred to and commonly called "dead freight". The remainder of the trains might on some occasion pick-up at the discretion of the chief dispatcher depending upon the schedule requirements, tonnage available and other operating factors.

Q. How many of the pick-up trains do you have in

operation on the Cotton Belt? A. In terms of reference to pick-up trains, are you excluding locals in this category?

Q. Yes, excluding locals and excluding what is referred to as "expedited trains"? A. As previously stated there are only three trains shown on this statement that regularly pick-up or set-out at points on the Cotton Belt.

Q. Are there other such trains which are operated by the Cotton Belt which do not appear on this statement or which do not appear on Exhibit 42? A. Yes.

Q. Did you say that you did not know the dates during which this study was to be completed? A. As previously stated, I was aware that the study was being made and that there was a starting and ending point of the study; however, this study was carried on at the direction of my staff in Pine Bluff and I do not or did not——

Q. There was a time limitation in which this study was to be made? A. Yes, sir.

Q. But you do not know that time limitation? Is that correct? A. As to the specific dates, no.

Q. Mr. Lacy, in your statement you indicate that a brakeman on a north bound trip out of Arkansas departs the train at Malden, Missouri some ten miles north of the Arkansas border. Why does not the fireman depart the train at that location also? This is on Page 6 I believe. A. The answer to your question is contained also on Page 6 which states that there is no terminal for firemen between Illmo and the Arkansas State line at which a fireman can be added or taken off.

Q. With a terminal for brakemen, why isn't there also a terminal there for firemen? A. The brakemen on this property are represented by the Brotherhood of Railroad Trainmen. The firemen on this property are represented by the Brotherhood of Locomotive Engineers and Firemen. Their working agreements are separate and distinct. The B. of R. T. provides for a terminal for brakemen at Malden. The B. of L. F. E. contract does not.

Q. Then, the terminals are determined by agreement between the Cotton Belt and the Brotherhood or labor organization involved? Is that correct? A. That is correct.

Q. And the fact that the fireman either boards the train or detrains at Illmo rather than Malden has nothing to do with the Arkansas Full Crew Law, does it? A. If it were not for the Arkansas Full Crew Law, we would not have a fireman or an additional brakeman on the through freight trains between Illmo and Jonesboro.

Q. The Arkansas Full Crew Law doesn't have anything to do with the determination of the location of the terminals though, does it? A. Not to my knowledge, no.

Q. Operation of switch engines or switching trains in the gravity yard at Pine Bluff are substantially different from the operation of these engines in other yards, are they not? A. I would have to have a definition of "substantial" as used in this regard.

Q. Well, are the operations of the crews in the gravity yard any different from the operation of crews in yards other than the gravity yard? A. By virtue of the type yard referred to as the gravity yard in Pine Bluff, there are some differences in operation as compared to a flat or saucer type yard; however, the operations of the Pine Bluff terminal encompass all type switching that is performed at saucer or flat type yards.

Q. Would there be any difference in the amount of the flat type switching in a gravity yard as opposed to the other yards operated by the Cotton Belt? A. There would be a difference in the amount of flat switching performed at the gravity yard as compared to each of the other indivdual flat type yards. The degree or percentage of flat switching as performed in Pine Bluff compared to flat switching at each of the other flat yards, I have no figures to show a comparison.

Q. Mr. Lacy, you indicate there are some fourteen switching crews operated in Pine Bluff with six man

crews. These crews perform industrial switching within the yard limits of Pine Bluff, do they not? A. Generally, yes.

Q. There is no industrial switching in the gravity yard at Pine Bluff, is there? A. There is no private industry switching within the confines of the complex known as the gravity yard at Pine Bluff.

Q. Does the Cotton Belt have maintenance facilities at Pine Bluff? A. Yes.

Q. These maintenance facilities are not located in the gravity yard, are they or pardon me, are they located in the gravity yard at Pine Bluff? A. By "maintenance facilities" I assume you are referring to maintenance of equipment facilities as opposed to maintenance of way facilities?

Q. That is correct? A. There is a one spot light repair rip track located in the gravity yard complex and there is a diesel facility also located at the gravity yard.

Q. Is there also another facility referred to as the rip track which is located outside the gravity yard which is used by the maintenance people, your maintenance people? A. Yes, there is a maintenance of equipment heavy repair shop located at a point outside of the gravity yard complex.

Q. Are there any public crossings within the gravity yard at Pine Bluff, public crossings, railroad with street or highway? A. That is a county road that crosses the main track and number one lead and also the tail of the wye track which is in the immediate area known as the Pine Bluff gravity yard; however, this road crossing is at the extreme limits of the Pine Bluff gravity yard.

Q. It is on the south end of the gravity yard, isn't it? A. Yes.

Q. You mention in your statement operations of the Southern Pacific Company which I believe runs its railroad, its railroad runs from Corsicana, Texas to Los

Angeles? Is that correct or a main line of its railroad runs between those two points? A. This is correct.

Q. Have you ever ridden on a train over that territory from Corsicana to Los Angeles? A. I have ridden a train from Los Angeles to New Orleans and from Los Angeles to El Paso.

Q. Are these the only two trips that you have made over this line? A. Yes.

Q. When were those trips made, how long ago? A. The trip from Los Angeles to New Orleans was made in 1945 and the trip from Los Angeles to El Paso was made in 1963.

Q. How do you know the crew consist of freight trains operated between Corsicana, Texas and Los Angeles, California? A. I spent two weeks on the Southern Pacific system between San Francisco and Sparks, Nevada and between San Francisco and Los Angeles and between Los Angeles and El Paso and I had an opportunity to study the operation of the entire Pacific Lines of Southern Pacific with personnel in the superintendent of transportation's office in San Francisco with a view of analyzing and studying the operations over the entire Pacific Lines of Southern Pacific.

Q. When did you spend this two weeks on the Southern Pacific Lines? A. In November of 1963.

Q. Then, this is when you made your one trip from Los Angeles to El Paso on a train over this line? A. That is correct, yes.

Q. Other than the one trip you made between Los Angeles and El Paso over this line, the information which you have about the Southern Pacific operations between Corsicana, Texas and Los Angeles is what someone told you? Is that correct? A. It is a combination of what the officers entrusted with supervising the operation over this territory told me plus what I observed on this trip.

Q. What did you observe on this one trip, Mr. Lacy, between Los Angeles and El Paso? A. I observed all the

things that a operating officer would normally interest himself in such as the trains met, the conduct of the train crew, how they performed their duties, the operation of the signal system, hotbox detecting equipment and many, many other facets of the operations.

Q. And all this on this one trip between Los Angeles and El Paso in 1963? A. Right.

Q. Where did you ride on this train? A. I rode the engine a portion of the time and part of the time was spent in the dining car and other parts of the train.

Q. Is this a passenger train? A. Yes.

Q. That you rode? A. Yes.

Q. And you have never ridden a freight train between Los Angeles and Corsicana? A. I have never ridden a freight train between Los Angeles and El Paso. I did ride the rear end of a train between Corsicana and San Antonio and between San Antonio and Coriscana, the exact date I do not remember.

Q. And these are rides in addition to the two rides you told us about earlier? A. Yes. As I was recalling the events of a trip from Los Angeles to El Paso, I remembered the additional trip that was made between Corsicana and San Antonio some time either in 1962 or 1963.

Q. How far is it between Corsicana and San Antonio? A. I do not know the exact mileage.

Q. Could you estimate it for us? A. Really I do not know it. It is about a six hour run on some of the more expedited type trains.

* * * *

Q. Mr. Lacy, is a record kept of the number of malfunctions or alarms on the motive power on the Cotton Belt system? A. There is a work report that is maintained on each lead diesel unit for the purpose of reporting malfunctions, yes.

Q. Each time an engine experiences ground relay action, is that reported? A. Would you repeat that question, please?

Q. Each time that an engine experiences ground relay action, is that reported? A. If this malfunction results in a delay or an isolation of the unit, it is reported or rather it is supposed to be reported.

Q. If any malfunction occurs such as ground relay action which is corrected without the train experiencing any delay, is that reported? A. In a number of instances, yes.

Q. What kind of instances, Mr. Lacy? A. It should be reported on the work report and is customarily reported to mechanical personnel at the end of the run usually orally.

Q. If an over speed trip occurs on an engine and there is no delay of the train from that over speed trip action, is that reported? A. Would you repeat the question again?

Q. If an over speed trip occurs on one of the engines on a train and no delay results from that, is that reported? A. In the previous answer I believe I covered this same question, that is, that a report should be made of all malfunctions of equipment regardless of delay on the work report and is usually reported orally at the next terminal to the appropriate mechanical personnel.

Q. Mr. Lacy, on Page 9 you make the statement that "As demonstrated on Exhibit 42 there are few engine malfunctions and about ninety percent of these merely represent ground relay action". I am interested to know where you got that figure? A. In the course of performing my duties, I ride many, many trains over all portions of the Cotton Belt and this is an estimate based upon actual observation, analyzing morning reports which indicate delay or loss of train speed either by reduction of horsepower for short periods or for long periods of time and from discussion with road foremen of engines who constantly ride all types of trains and from discussion with mechanical officers who are entrusted with the duty of maintaining motive power.

Q. How many trains do you ride during the course of a

year, Mr. Lacy? A. I do not have the record readily available but it is a good percentage of the time.

Q. Could you give us an average number per month? A. Well——

Q. That you ride? A. It varies from month to month.

Q. What is the least number that you have ridden in any one month? A. One or none if you have to consider none as a number.

Q. What is the most you have ever ridden in any one month? A. Without benefit of the records, I am unable to determine. I suspect that some months I have ridden as many as twelve to fifteen trains but this would have to be authenticated by the records that I might develop the information from.

Q. Have you ever operated as an engineman? A. No.

Q. When you ride trains, where do you usually ride, on the head end or the caboose? A. Prior to 1965, I usually rode the head end of the train. After 1965, when I became superintendent, as a rule I would ride the business car on the rear of the train and or the caboose and for some trips I have ridden the head end since 1965.

Q. On page 9 you also refer to a number of newer engines. Your statement is "A number of our newer engines are equipped with a reset button located near the engineer, which he can use to reset the ground relay switch on any unit in the locomotive consist.". What model engines are you referring to there, Mr. Lacy? A. I am not familiar with the model number of the engines that are referred to here.

Q. Do you know whether it is one of the newer models? A. Yes, it is on some of the newer models.

Q. Do you know how many of these models your railroad has? A. No.

Q. Isn't it true that the only time the engineer can use this reset, can use this button to reset ground relay switch on any trailing unit is if those trailing units are also of

the same model as the lead unit? A. I can neither verify nor refute that statement.

Q. Mr. Lacy, have train accidents increased or decreased on your railroad in the last four or five years? A. In order to answer that question, I would have to have the analysis of reports made covering accidents over this period of time and I do not have this information with me.

Q. Would your answer be the same if I asked you about the increase or decrease in collisions? A. The answer would be yes.

Q. Mr. Lacy, on Page 8 of your statement, the first sentence of the first full paragraph you refer to the data on Exhibit 42 and I am paraphrasing what you say this is characteristic of our daily train operations. Are you referring to your total operations or are you referring to your daily operations of these trains which have been reported on in Exhibit 42? A. Both.

Q. The number of through freight trains and local trains reported on is not charactertistic of the daily operations of your railroad, is it? A. Except for percentage wise, yes.

Q. The number reported on both categories do not bear any relationship to the number of trains actually run in each of those categories, does it? A. With the exception of percentages, yes.

Q. Percentages is what I was referring to, Mr. Lacy. Mr. Lacy, do you have any information as to the number of employees in the fireman category in 1930? A. No.

Q. Would you know whether or not the number of employees in the fireman category has increased or decreased since 1930? A. Well——

Mr. Light: Do you mean in the employment of his railroad?

Mr. Ross: In the employment of the Cotton Belt Railroad.

The Witness: I do not have any statistical data nor am I familiar with the operation of the Cotton Belt in 1930.

Therefore, I am unable to compare present employment with the employment that existed in 1930.

By Mr. Ross: Q. What about brakemen? Do you have any knowledge of the number of brakemen employed in 1930 and whether or not that number has increased or decreased since that time? A. The answer to that question is the same as referred to in the previous question.

Q. Would you know how many steam engines the Cotton Belt had in 1930? A. No. I was only four years old at that time.

* * * *

Redirect Examination,

By Mr. Light:

Q. With regard to your opportunity to be familiar with Southern Pacific Railroad Company operations, is there any relationship between your railroad and that company? A. Yes, the Cotton Belt Railroad is a subsidiary of the Southern Pacific.

Q. In your position as superintendent of the Cotton Belt Railroad, do you have any opportunity or occasion to be in contact or communication with the officials of Southern Pacific? A. Yes, on numerous occasions and at all levels.

Q. Mr. Ross used the term "pick-up trains" with respect to through freight trains and I am not familiar with that term before hearing it here today. Is any through freight train that makes a pick-up called a "pick-up train" on your railroad? A. No. There are a number of instances where bad orders are picked up by through freight trains.

Q. What is there about a pick-up train that sets it apart from other trains and therefore entitles it to be called a "pick-up train"? A. There is really nothing except that in some instances, for example, we operate a train daily between Pine Bluff and Texarkana. That is referred to as a pick-up train because this train regulaly picks up at three or more points between Pine Bluff and Texarkana

and is referred to in railroad nomenclature as a pick-up train.

Q. Mr. Lacy, you indicated that there are some local freight crews operated in Missouri with a six man crew. Is that correct? A. That is correct.

Q. Do those local freights also operate into Arkansas? A. That is correct.

Q. Has there been any modification of your flagging rule 99 J in recent years? A. Yes.

Q. State the substance of it, please? A. In centralized traffic control or automatic block system opposing and following, flag protection is no longer required.

Q. When the train is stopped on the main line? A. That is correct.

Q. Mr. Lacy, this trial is scheduled to commence next Monday and continue for an estimated two weeks. Can you tell me where you will be physically located during that period? A. I am presently enrolled at the Massachusetts Institute of Technology in Cambridge, Massachusetts for a nine weeks course which began two weeks ago and has seven more weeks to continue.

Q. Are you returning to Massachusetts today? A. Yes.

* * *

Recross-Examination,

By Mr. Ross:

Q. What are the speed limits on pick-up trains on the Cotton Belt in Arkansas? A. All freight trains operating within and without the State of Arkansas are authorized a maximum permissible speed of sixty-five miles an hour with the exception of two authorized expedited trains that are operated or rather that are authorized to operate at a maximum permissible speed of seventy miles per hour.

Q. Does the Cotton Belt have any local freights operating on its main line exclusively within the State of Missouri which have a train crew of conductor and three brakemen? A. Not at this time, no.

Q. When is the last time they did have such trains? A. I really don't know.

* * * *

PLAINTIFFS' EXHIBIT NO. 33—
Testimony of J. A. Haley.

INTERVENORS' REBUTTAL EXHIBIT NO. 33—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 34—
Testimony of A. B. Finch.

INTERVENORS' REBUTTAL EXHIBIT NO. 34—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 35—
Testimony of H. R. Leggett.

INTERVENORS' REBUTTAL EXHIBIT NO. 35—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 36—
Testimony of D. T. Hopkins.

My name is D. T. Hopkins. I am employed by St. Louis Southwestern Railway Company (Cotton Belt) as Road Foreman of Engines, with headquarters at Pine Bluff, Arkansas. My assigned territory is between Pine Bluff, Arkansas, Texarkana, Arkansas, Shreveport, Louisiana

and North Little Rock, Arkansas. I was first employed by the Cotton Belt in October 1936 in the Store Department at Pine Bluff. On August 19.. I was employed as a fireman on the Pine Bluff Division with headquarters in Pine Bluff. I was promoted to engineer in January 1944. I worked as either a fireman or engineer until January 1958 when I was promoted to Road Foreman of Engines at Commerce, Texas. I served as Road Foreman of Engines at Commerce, with assigned territory between Dallas, Fort Worth and Texarkana, Texas for five years until transferred to Pine Bluff in March 1963.

As fireman, I worked on local freights, through freights, yard engines and hostling. I served as a fireman on steam locomotives for about three years until we began converting to diesels and worked on steam locomotives that burned coal, as well as those that burned oil. I worked as fireman on hand fired, coal burning locomotives in both through freight, local and yard service. In that service, about 75 to 85% of my time was devoted to shoveling coal and watching the gauges. On modern diesel locomotives, 98 to 100% of the time the fireman has no duties to perform other than to keep a lookout.

During my 17 years' service as a fireman and engineer, I worked on trains over the entire Cotton Belt system north of Texarkana and on yard engines in all of the yards. As Road Foreman of Engines during the past eight years, my duties have consisted of riding engines both in road and yard service primarily in Texas and Arkansas, but I have also served in Missouri and Illinois, instructing the engine crews in the proper handling of the locomotive and train and in how to handle any mechanical difficulties which arise. I ride at least 30 or more trains a month, and frequently observe and ride yard engines.

In June 1966, I participated in a study of train operations in freight and yard service on the Cotton Belt. The purpose of the study was to compile information

with respect to the operation of trains with and without a fireman and with and without a third brakeman. I was instructed to ride in the cab of the locomotives on freight runs and to observe and take notes regarding the activities of the fireman and train crews and to compile information regarding the characteristics of the train movement. Data regarding the eight runs I observed appears in Exhibit 42 entitled "Analysis of Road Freight Runs—St. Louis Southwestern Railway Company," on the lines on which I am shown as the observer in column 21.

I made eight trips on through freight trains over my territory during the period June 20 through June 28. Six of the trips were in Arkansas between Pine Bluff and Texarkana on the BSM, the CB and the ABSM, all of which are through trains operated daily between East St. Louis, Illinois, and Corsicana, Texas. Two of the trips were in Arkansas and Louisiana on Trains 143 and 130, which operate daily between Pine Bluff and Shreveport. A fireman and a third brakeman were included on all of the crews since each train operated in the State of Arkansas.

The six trains I rode between Pine Bluff and Texarkana were operated with from two to seven diesel units and from 32 to 85 cars, and made the 155-mile run in times ranging from 2 hours 48 minutes to 3 hours 10 minutes. With one exception, all six trains operated from terminal to terminal without stopping. Train CB on June 20 made two stops, one of five minutes' duration to meet another train and another of two minutes for the head brakeman to line a switch within the Pine Bluff yard. On four of these trips, except for routine inspection leaving the terminal, the fireman performed no function other than to remain in his seat and keep a lookout and call signals. On the BSM run of June 20, the ground relay on the lead unit tripped twice. On this occasion, the fireman merely got up from his seat and pressed the ground

relay reset button located behind the engineer's seat on the rear wall of the cab. On the CB run of June 25, the ground relay switch tripped on one of the trailing units and the fireman went back and reset it by pressing the reset button. Had this occurred on a run in Texas or Illinois, where our trains are operated without a fireman, the engineer would have safely performed this function by, in the first instance, simply pressing the button on the wall behind him and, in the second instance, by stopping the train and going back to the trailing unit himself. Neither the fireman nor the third brakeman on these runs performed any functions which could not have been safely and adequately performed by a 4-man crew.

As shown on Exhibit 42, both the locomotive and car consists on these trains remained essentially the same for the entire 753-mile trip between East St. Louis, Illinois, and Corsicana, Texas, and each was operated safely over the Illinois and Texas subdivisions with 4-man crews.

On June 27, I rode train 143 southbound from Pine Bluff to Shreveport and on June 28 rode train 130 northbound from Shreveport to Pine Bluff. These trains are operated daily and are manned with 6-man crews during the entire run even though 38 miles of each run is in Louisiana. This is because there is no terminal at the Arkansas state line at which the extra crew members can be added to or removed from the crew. Train 143 consisted of four diesel units and 124 cars and made the run in 5 hours and 36 minutes with two stops to meet opposing trains. En route the engine in the rear unit died. The other three units afforded ample power to continue the run but the fireman went back on the rear unit and stayed for about 45 minutes trying to start it. He returned to the control cab and advised he could not start it. I later went back and started it. The engine in the lead unit registered hot and the fireman attended to this by merely turning the isolation switch in the

cab, which took the unit off the line to permit it to idle until it cooled. After it cooled, the fireman put it back in service by merely turning the isolation switch to "run" position. Ground relay action occurred on one of the units and the fireman went back to the unit and reactivated it by pressing the reset button. Had a fireman not been aboard, the engineer would have safely performed these functions.

Train 130 consisted of three diesel units and 91 cars and made the run in 5 hours 52 minutes with two stops to meet opposing trains. En route the hot engine alarm sounded for the third unit and the fireman remedied this in the same manner as described in the preceding paragraph. Had the fireman not been aboard, the engineer would have safely isolated this unit by stopping the train and going back and turning the isolation switch himself.

Based on my experience and observations over a period of 16 years working as a fireman and engineer and over the past eight years as Road Foreman of Engines, constantly riding engines observing and instructing train and yard crews in both Texas and Arkansas, I know that the brakeman or third helper presently assigned to the crews of our trains and yard engines in Arkansas are unnecessary and that they perform no functions which cannot be performed safely and adequately by a 4-man crew.

INTERVENORS' REBUTTAL EXHIBIT NO. 36—
Cross-Examination,

By Mr. Ross:

Q. State your name and address, please sir? A. D. T. Hopkins, 2308 West 40th, Pine Bluff, Arkansas.

Q. What is your educational background, Mr. Hopkins? A. High school education.

Q. You graduated from high school? A. Yes, sir.

Q. What high school? A. Pine Bluff high school.

Q. What employment have you had other than employment for the St. Louis Southwestern Railroad Company? A. Oh, for about one year with Kenneth Kraft, Pine Bluff.

Q. And what was the nature of this employment? A. Salesman.

Q. Any other employment? A. No.

Q. The St. Louis Southwestern Railway Company is also referred to as the Cotton Belt Railroad? A. Yes, sir.

Q. Mr. Hopkins, you mentioned in your statement that you had operated on hand fired coal burning locomotives. Have you also operated on—pardon me, I see you also said you operated on oil fired? A. Yes, sir.

Q. Steam locomotives? A. Yes, sir.

Q. In operating as a fireman on oil fired steam locomotives, what percentage of your time would you be available to perform the lookout function? A. Oh, I would judge about seventy-five to eighty-five percent.

Q. Did you ever operate on the stoker fired steam locomotives? A. No, sir.

Q. As a fireman or engineer? A. No, sir.

Q. You indicated in June of 1966 you participated in a study of train operations in freight and yard service on the Cotton Belt? A. Yes, sir.

Q. What instructions did you receive concerning this study? A. We were instructed or requested by the superintendent to participate in this study and ride a certain amount of trains between Pine Bluff and Texarkana and Shreveport.

Q. What instructions did you receive concerning the observations that you were to make on these runs included in this study? A. We observed the crew members or members of the crew, kept records of any delays and what performance that the crew members done as a result of the delay.

Q. Who picked the runs to be included in the study?

A. We had no particular trains other than through freight between Texarkana and Shreveport and Pine Bluff.

Q. What do you mean now you had no particular trains other than through freights on this territory? A. We had no scheduled trains specified.

Q. Were you instructed as to which trains to ride? A. No, not other than just through trains between Pine Bluff, Texarkana and Shreveport.

Q. Did you ride any locals? A. No, sir.

Q. You were instructed to ride through freight trains? A. Yes, sir.

Q. Between Pine Bluff and Texarkana, did you ride any trains other than expedited trains? A. Yes, sir.

Q. Which trains were those, Mr. Hopkins? A. I believe it was the A. B. S. M.

Q. Is this not considered an expedited train? A. We don't operate on an expedited schedule.

Q. You don't operate this particular train on an expedited schedule? A. Yes, sir.

Q. What is the difference in this train and the expedited trains? A. On our expedited trains and they are designated by "X", the B. S. M. X. or C. B. X. are permitted to make seventy-five miles an hour on tangent tracks, sixty-five miles an hour on all curves, five miles an hour over the maximum permissible speed on restricted carriers.

Q. The A. B. S. M. is not operated under these speed restrictions then? A. No.

Q. Does the A. B. S. M. make any stops between Pine Bluff and Texarkana other than to meet opposing trains? A. No, sir.

Q. What is the speed limit applicable to A. B. S. M. train? A. Sixty-five miles an hour on tangent and curves and the maximum permissible speed on restricted carriers.

Q. What is the speed restriction on other through freights, that is, through freights other than the expedited trains or the A. B. S. M. train? A. All trains other

than the expedited trains have the same schedule or same speed restrictions.

Q. Now, when you say "all other trains", you are speaking of through trains and not local trains? A. That would include locals, yes, sir.

Q. Local trains can operate at sixty-five miles an hour on a tangent track? A. Yes, sir.

Q. How did you choose the particular trains on which you were to ride for this study? A. I handled it mostly just in my line of work or duty. I usually tried to ride with each engineer on my territory at least once a month. At that time I probably had approximately thirty-one assigned engineers on that division.

Q. Mr. Hopkins, I am speaking of this particular study which you conducted. How were the runs chosen on which you were to ride? A. They were chosen by me. As I have previously stated, this was in line with my work. I was instructed to ride through trains between Pine Bluff, Texarkana and Shreveport and I picked these particular trains that I made the study on.

Q. You picked them for your own convenience? A. Not particularly my own convenience but in line with my work.

Q. So, for your own convenience in line with your other duties that you perform as a road foreman of engines? A. As I previously stated, I attempt to ride with each engineer at least once a month if possible and we do not have assigned trains for each crew. They were first in and first out and in the event that the engineer I wanted to ride with is going out on that particular train, then I made the trip with him.

Q. The through freight trains other than the expedited trains and the A. B. S. M. train makes stops for the purpose of picking up and setting outcars while operating over this territory, do they not? A. I don't believe—I don't believe I got the first part of your question there, Mr. Ross.

Q. All right. The through freight trains or will the through freight trains make any stops between Pine Bluff and Texarkana usually? A. We do have a dead freight south that will normally be called to handle all shorts. We may have some particular cars that might have to be set-out at Lewisville either for the Shreveport branch or sometimes our Shreveport train will set-out at Lewisville for the Texas division and we will set those cars out, yes, sir.

Q. You mentioned that sometimes these trains would have shorts. What do you mean by "shorts", Mr. Hopkins? A. Well, shorts would be short of the terminal at Texarkana. For instance, set-out for Fordyce, Camden, et cetera.

Q. These are cars that are to be set-out? A. Destined for there.

Q. On the line somewhere between Pine Bluff and Texarkana? A. Yes, sir, destined for those.

Q. Mr. Hopkins, in your statement on Page 2 referring to this study you say that "In June, 1966 I participated in a study of train operations in freight and yard service on the Cotton Belt". I don't see in the exhibit any reference to yard service nor do I see in your statement any reference to any particular yard work. Why was this? A. To the best of my recollection, I was instructed to do so but other duties prevented me from making the study in yard service and I believe that portion of this statement was turned over to Mr. Walker, road foreman of engines on the northern division out of Pine Bluff.

Q. Then, your reference to participating in a study of train operations in freight and yard service is inaccurate? A. That portion of the yard service would be, yes, sir.

Q. All right? You mentioned that you were instructed to ride in the cab of the locomotives on freight runs and to observe and take notes regarding the activities of the firemen and the train crews. Do you have those notes here with you today, Mr. Hopkins? A. No, sir.

Q. Did you bring them to Little Rock with you? A. No, sir.

Q. Did you ride in the lead unit of all of these locomotives? A. Yes, sir.

Q. Then, you were unable to observe any of the train crew that were riding in other than the lead locomotive? A. I was in a position to, anyone in the first, second and third units, yes, sir.

Q. But you were not in a position to observe anyone in the caboose then, I take it? A. No, sir.

Q. Then, your observations do not apply to any of the train crews who were riding in the caboose? A. Other than prior to or leaving the terminal or at the register there. I observed what duties they might perform. Normally at Pine Bluff we transfer our crew members in a carryall and normally I would ride with them and observe them as they were going to their duties.

Q. Any of your observation on the line of road would not apply to the crew members riding in the caboose, would they? A. No, sir, not while in route.

Q. Mr. Hopkins, the Cotton Belt does not have a rule prohibiting firemen from patrolling engine units, do they? A. No, sir.

Q. Do any of your locomotive units in road service have any type of automatic train stop device? A. We have the deadman control and or the alerter on the majority of our short and local engines but not in our red equipment, no.

Q. Then, your answer to my original question would have been no? A. I understand you to say did any of our units is the reason I——

Q. My question was did any of your road units? A. No.

Q. Or units used in road service and the answer to that was no? A. Yes, sir.

Q. Mr. Hopkins, the portion of the Cotton Belt track located in Lewisville, Arkansas and Shreveport is what is known as a "dark railroad", is it not? A. Yes, sir.

Q. And by dark railroad we mean an absence of auto-

matic block signals or centralized traffic controls? A. Yes, sir.

Q. Trains running over this territory are operated by timetable and train order? Is this true? A. Yes, sir.

Q. Trains operating over this territory are required to afford flag protection to the rear in the event they stop, are they not? A. Yes, sir, unless they are provided with a train order with our wait order.

Q. Is this a form Y train order that you are referring to? A. Flagging order, yes, sir.

Q. How many trains operate daily over this track from Lewisville to Shreveport? A. We have three south bound through freights and three north bound and we have a tri-weekly local.

Q. So there would be seven regularly scheduled trains operating between Lewisville and Shreveport? A. Yes, sir.

Q. In one direction or the other? A. Yes, sir.

Q. Each day? A. Yes, sir.

Q. How many trains operate each day between Pine Bluff and Texarkana. Pardon me, let me rephrase that question, please sir. How many trains occupy some portion of the track between Texarkana and Pine Bluff each day? A. You will have to give me a moment to count these. Did I understand you to say between Pine Bluff and Texarkana?

Q. Yes, sir, trains which occupy some portion of this track, not necessarily those which go all the way from Pine Bluff to Texarkana? A. Well, now, we operate our Shreveport trains to Lewisville which is twenty-nine miles north of Texarkana. Those trains could be included although they don't go to Texarkana.

Q. Mr. Hopkins, to save time, let me ask you if I have the correct number of trains here. There are seven through freight trains from Pine Bluff to Texarkana each day? Is that true? A. Let's see, the A. B. S. M., two B. S. M.'s, no two days a week we only run the one B. S. M. and so it would vary. That is approximately correct, yes, sir.

Q. Mr. Hopkins, are there normally six expedited trains which operate between Texarkana and Pine Bluff each day? A. There are six through trains but they do not operate on an expedited schedule.

Q. Mr. Hopkins, I have been informed that there are twenty trains, and this includes through trains and what we have referred to as expedited trains, which operate between Pine Bluff and Texarkana each day. Is this figure correct? A. Well, I can name you the south bound trains to be run out of Pine Bluff beginning around twelve midnight the A. B. S. M. which has been set up to operate five nights a week but I think due to heavy traffic we are operating that particular train daily. Then on, with the exception of Thursdays and Fridays, we run two sections of the B. S. M. X. which is the expedited schedule south bound. Then we operate two 43's into Shreveport out of Pine Bluff, one 343 into Texarkana out of Pine Bluff, a T. M. S. out of Pine Bluff which is a through train and a T. S. S. is a Shreveport train that sets out a connection at Lewisville and the dead freight south. That is our normal operation southbound. We also operate, we have daily service between Pine Bluff and Camden, local service, have a tri-weekly Camden to Texarkana local.

Q. How about the north bound traffic now? A. That depends on our business moving north. The S. P. just gives us a connection. It might be an S. S. E. or R. D. V. or C. B. et cetera. We don't have any certain number of trains north bound.

Q. At times are there as many as thirty trains operating over some portion of this territory each day? A. I'm afraid I couldn't answer that with any authority unless I made a check on it.

Q. Mr. Hopkins, can you give us an average number of trains running south each day and average number of trains running north each day? A. Out of Texarkana you mean?

Q. North bound out of Texarkana and Shreveport? A.

North bound to Pine Bluff, south bound from Pine Bluff. Well, south bound I believe I gave you practically all of our connections.

Q. All right, I have eleven trains as my total? A. North bound we have the three trains out of Shreveport which would be in the territory between Lewisville and Pine Bluff in a twenty-four hour period and occasionally we will deadhead a crew north if we don't have a train to compensate for the extra crew we have in Texarkana but normally I would say the same amount is north bound that is south bound.

Q. Is this single line main track? A. Yes, sir.

Q. Between Texarkana and Pine Bluff? A. Yes, sir.

Q. And between Shreveport and Texarkana? A. Yes, sir.

* * * *

By Mr. Lessenberry: Q. Does the Cotton Belt have or service the Pine Bluff Arsenal? A. Yes, sir.

Q. What type or category of freight will you either pick up or deliver at the Pine Bluff Arsenal? A. We have a connection that we will take to the Arsenal leaving the designated track and pick-up the outbound track.

Q. Well, for the benefit of the record here, can you tell us what products are made in the Pine Bluff Arsenal that might be delivered by railroad? A. Not specifically, no, sir. We do have some explosives.

Q. Do you have any poisonous gases? A. I couldn't make that statement because I'm not sure.

Q. Is it your information that there is? A. No, sir, I have no information. That is not on my territory.

Q. I understand. Now, do you have connections or does the Cotton Belt serve the Red River Arsenal? A. Yes, sir.

Q. Now, where is that located generally geographically? A. That is south of Texarkana.

Q. About how far? A. I would say in the vicinity of

eighteen or twenty miles. We branch off of the main line of the Cotton Belt at Red Water. There is a little station there and then we use the Arsenal tracks on up the Red River. A portion of it is Cotton Belt tracks and a portion of it is the Ordnance Plant.

Q. Now, I am rather uncertain of myself in the questions I ask but does the Cotton Belt serve El Dorado? A. No, sir.

* * * *

Redirect Examination,

By Mr. Light:

Q. Mr. Hopkins, are Mr. Green, Williams and Burroughs operating employees of your railroad that work in the territory over which you have jurisdiction? A. Yes, sir. Mr. Green is the engineer assigned to the territory between Pine Bluff, Texarkana and Shreveport and Mr. Williams is assigned as a fireman on this same territory. Mr. L. C. Burroughs is an extra conductor and his job assignments would be erratic but he has worked as a brakeman on the south end when he is not being used as a conductor.

Q. You are acquainted with these three gentlemen? A. Yes, sir.

Q. Have you had an opportunity to read the testimony that they have given and filed in this lawsuit? A. Yes, sir.

Q. Do you recall whether each of them refer to particular switching operations or locations in their testimony? A. Yes, sir.

Q. Are you familiar with each of those switching operations or locations to which they refer? A. Yes, sir.

* * * *

Q. Is it possible at all of those switching operations or locations to which I referred to perform the work without passing signals from the fireman's side?

Mr. Ross: I object to this question on the grounds that

it is a leading question and that it suggest the answer which Mr. Light is seeking from this witness.

The Witness: Yes, sir.

Mr. Light: With that objection noted, answer the question.

The Witness: Yes, it is possible.

By Mr. Light: Q. I direct your attention to the testimony of Mr. Green concerning Palco—is that P-a-l-c-o? A. Yes, sir.

Q. What is that location on your railroad? What is there? A. This is the Arkansas Power and Light Company generating plant that's located about midway between Stamps, Arkansas and Buckner, Arkansas.

Q. Do you happen to know how many hours one of your trains served that location or picked-up or set-out a car at that location during 1966? A. Yes, sir. According to our agent, Mr. Sims, at Stamps——

Q. You can't repeat something that somebody told you? A. Excuse me.

Q. Do you know this, Mr. Hopkins? A. Yes, sir.

Q. From records that are maintained? A. Approximately fifteen——

Q. Just a minute. Do you know it from records regularly maintained by the railroad company in the course of its business? A. Yes, sir.

Q. Now, how many times was service supplied at Palco by your railroad company during 1966? A. Fifteen times.

Q. What is the volume of traffic or the number of cars usually handled at that location? A. About one, two at the most.

Q. You have reference to cars? A. Yes, sir.

Q. Is there a rule on your railroad concerning how many men will ride in the control cab of the locomotive on the road? A. Our special instructions specify that the head brakeman or front brakeman will ride in the control compartment of the lead unit at all times between terminals.

* * * *

Recross-Examination,

By Mr. Ross:

Q. When was this regulation instituted by your railroad, Mr. Hopkins? A. I don't know the specific date on that.

Q. Can you give us an approximate date? A. No, sir.

Q. Mr. Hopkins, do you know whether or not this regulation has been instituted since this lawsuit was filed?

Mr. Light: For the information of the witness do you want to tell him when this lawsuit was filed?

Mr. Ross: When was it?

Mr. Light: The lawsuit was filed April 10, 1964.

The Witness: I'm not sure.

* * * *

By Mr. Lessenberry: Q. For further cross-examination, I understood from your testimony that the Cotton Belt does serve Camden, Arkansas? A. Yes, sir.

Q. And, of course, at one time Camden was an extremely large Naval Depot maintained there by the United States Government? A. Yes, sir.

Q. Is this correct? A. Not at Camden. It was at Shumaker.

Q. Just outside of Camden? A. Yes, sir.

Q. Do you have information that this Government complex has been purchased by private individuals in the City of Camden for a large industrial area? A. It is my understanding that that complex was purchased by Brown-Root Company.

Q. For industrial purposes? A. Partially and then they have, they are utilizing a lot of their warehouses et cetera for storing purposes, potash, cotton.

* * * *

PLAINTIFFS' EXHIBIT NO. 37—
Testimony of H. D. Walker.

INTERVENORS' REBUTTAL EXHIBIT NO. 37—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 38—
Testimony of H. E. Carraway.

INTERVENORS' REBUTTAL EXHIBIT NO. 38—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 39—
Testimony of W. F. Masters.

INTERVENORS' REBUTTAL EXHIBIT NO. 39—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 40—
Testimony of Ralph Miller.

INTERVENORS' REBUTTAL EXHIBIT NO. 40—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO 41—
Testimony of V. J. Berry.

INTERVENORS' REBUTTAL EXHIBIT NO. 41—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 42—
Analysis of Road Freight Runs.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 43—
Testimony of C. R. Morris.

INTERVENORS' REBUTTAL EXHIBIT NO. 43—
Cross-Examination of C. C. Mueller.

PLAINTIFFS' EXHIBIT NO. 44—**Table.**

PLAINTIFFS' EXHIBIT NO. 45—**Table.**

[Omitted from Appendix.]

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1967

NO. 950

BROTHERHOOD OF LOCOMOTIVE FIREMEN & ENGINEMEN, ET AL., Appellants,

vs.

CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD COMPANY, ET AL.

NO. 973

ROBERT N. HARDIN, PROSECUTING ATTORNEY FOR THE SEVENTH JUDICIAL CIRCUIT OF ARKANSAS, ETC., ET AL., Appellants,

vs.

CHICAGO, ROCK ISLAND AND PACIFIC RAILROAD COMPANY, ET AL.

APPEALS FROM THE UNITED STATES DISTRICT COURT FOR THE WESTERN DISTRICT OF ARKANSAS

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Volume II—Exhibits.

Volume III—Exhibits.

VOLUME III.

PLAINTIFFS' EXHIBIT NO. 46—Testimony of R. J. Blair.

My name is Rome J. Blair. I am Vice President and General Manager of The Kansas City Southern Railway Company and affiliated companies with headquarters at Kansas City, Missouri.

I entered the service of The Kansas City Southern Railway Company, and its predecessors, July 23, 1927, and have worked as Yard Clerk, Brakeman, Conductor, Yardmaster, Trainmaster, Superintendent, Assistant General Manager, and as General Manager and Vice President and General Manager since January 1, 1958, to the present date.

In my present capacity I am in charge of all phases of operation which includes Transportation, Maintenance-of-Way and Maintenance of Equipment—procurement of new equipment, new facilities, and improvements in the roadbed, track structures and appurtenant facilities. By reason of this experience and performance of these duties I am conversant with the operations of The Kansas City Southern Railway Company and the duties and work performed by members of the train and engine crews.

Main line trackage of The Kansas City Southern Railway Company, as shown by Exhibit 1 hereto, extends through the states of Missouri, Kansas, Arkansas, Oklahoma, Texas and Louisiana.

There have been many improvements in all phases of railroad operations in the nation, including Arkansas, in recent years and particularly since 1930.

The Kansas City Southern Railway Company has 154.006 miles of main line trackage in Arkansas. In the 1930's none of this trackage was protected by block sig-

nals, and at that time only two street crossings (one in Mena and one in DeQueen) were protected by automatic wig-way signals. Today, all main line trackage is protected by automatic block signals. Approximately 93 miles of this automatic block system, in Arkansas, are now within Centralized Traffic Control territory—and passing track switches in this territory are remotely controlled. All train movements through most of the hilly terrain in the State of Arkansas are governed by the Centralized Traffic Control System, thus providing convenience and safety to train and enginemen, the travelling public, to equipment, rolling stock and lading. Exhibit 2 hereto shows the signal protection in effect on the Kansas City Southern, including information as to installation dates.

Detail regarding grade crossing protection on the Kansas City Southern appears in Exhibit 3 hereto. Only two railroads cross the Kansas City Southern main tracks in Arkansas, and these are protected with interlocking plants. There are now fifteen (15) street or highway crossings in the State of Arkansas which are protected with automatic flashing light signals. These signals have been installed at those crossings or intersections where the volume of vehicular traffic or physical features require them. We have participated with State and Federal Government on all crossings in the State of Arkansas that have qualified under the Arkansas formula as requiring flasher light protection. In addition to the fifteen (15) street or highway crossings in the State of Arkansas, which are protected with automatic flashing light signals, there are eleven (11) grade separations at various locations. There are, of course, crossings in the State of Arkansas which are protected by the prescribed standard crossbuck and advance warning signs installed by the Highway Department. At those locations the small volume of traffic simply does not warrant additional protec-

tion. These crossings, generally, are located in rural and sparsely populated areas.

Other improvements in Safety of Operations involve changes in rail and inspection facilities. In 1930, of the 154.006 miles of main line trackage in Arkansas, 105.865 miles consisted of 85 pound rail, 35.940 miles 100 pound rail, and 12.201 miles 127 pound rail. As the result of a continuing rail relaying program, all of the 85 and 100 pound rail had been removed by 1946, and at that time 51.825 miles consisted of 112 pound rail, and 102.181 miles of 127 pound rail. As of June 30, 1966, this trackage consisted of 34.908 miles of 112 pound rail, 1.920 miles of 115 pound rail, 96.841 miles 127 pound and 20.337 miles 136 pound rail. The installation of this heavier rail, through the years, has resulted in improved and safer operations.

We have various items of modern machinery and track maintenance equipment, all of which has permitted better maintenance of trackage with consequent improvement in safety of operations.

Since March of 1937, we have employed the services of the Sperry Rail Service which utilizes sophisticated electronic equipment to inspect for latent track defects. These inspections are made approximately each six months through the entire State of Arkansas, as well as the other states in the System. This inspection service is in addition to visual inspection and thus affords greater safety and reliability.

Prior to 1939, steam locomotives were the only source of power. In 1939, our railroad began the use of diesel-electric powered locomotives and since 1952 the railroad has been completely dieselized. The operation of the diesel-electric powered locomotives has markedly simplified the duties of enginemen and has contributed to safety of operations.

There have been continuous technological improvements in the development, manufacture, and use of automatic

couplers, engine and air brake systems, as more fully explained by Mr. Meinholz and Mr. German.

The advent of two-way radio in 1945, affording communication between the caboose and engine and wayside stations, has greatly improved communication between members of the crew and wayside stations. For all practical purposes the VHF type radio installation was completed in the early part of 1964 in engines, cabooses, wayside stations, mobile units and various other points, and we continue to install this type in new equipment as received. The two-way radio communication simplifies the work and reduces the work load of train and enginemen, and all Kansas City Southern trains and work equipment are so equipped with these radio facilities. Additionally, on December 31, 1964, The Kansas City Southern Railway Company, through a lease, began using space on a microwave system essentially adjacent to its line of railroad which substantially improved its radio, telephone and data systems. Mr. Troth's description of the respects in which radio communication has improved safety of operations is also applicable to the Kansas City Southern.

At the present time engineers and members of crew in cabooses or locomotives can communicate with each other and directly with train dispatcher, wayside stations in the State of Arkansas, and the five other states through which we operate, conversely, dispatchers and wayside stations can do likewise, including various supervisory officers at Kansas City and Shreveport. The microwave and radio network in use by the Kansas City Southern is shown on Exhibit 4 hereto.

As Mr. Farrar's testimony shows, the size of the through freight crews used by the Kansas City Southern varies, depending upon whether the freight operations are conducted in the State of Arkansas or in the other states through which the Kansas City Southern operates. In Arkansas we are required to use six-man crews consisting

of an Engineer, Fireman, Conductor, and three brakemen. Our freight operations in other states are manned by crews consisting of four employees, an Engineer, a Conductor and two brakemen. These differences between the size of crews used in freight service in Arkansas and in other states through which the Kansas City Southern operates, are not justified by differences in the operations conducted in the various states or the physical and other circumstances involved. The physical characteristics of the train movements in Arkansas are not dissimilar from the characteristics of the movements in other states. The signal protection is much the same, track and roadbed characteristics are similar. The equipment used is the same in Arkansas and in other states. Train length does not vary appreciably on through freight movements and density of traffic over our Arkansas lines is much the same as the density on the lines in the other states through which the Kansas City Southern operates.

On the basis of my years of experience on the Kansas City Southern as an operating employee and an officer concerned with operations, I know that freight operations conducted in states other than Arkansas, with four-man crews, are as safe as similar operations conducted in Arkansas with a crew consisting of six employees.

[Exhibits to Testimony Omitted From Appendix.]

INTERVENORS' REBUTTAL EXHIBIT NO. 46—
Cross-Examination,

By Mr. Ross:

Q. State your name and address, please, sir? A. My name is Rome J. Blair. My address is 114 West 11th, Kansas City, Missouri.

Q. And you are the Vice President and General Manager of the Kansas City Southern Railway Company? A. I am the Vice President and General Manager of the Kansas City Southern Railway Company.

Q. And in that capacity I believe according to your statement you are in charge of all phases of operations including transportation, maintenance of way, maintenance of equipment, procurement of new equipment, new facilities, improvements in the road bed, track structures and appurtenant facilities, is that correct? A. That is correct, sir.

Q. On Page 3 of your statement, Mr. Blair, you mention two crossings, railroad with railroad over your territory in Arkansas and state that these crossings are protected by interlocking plants. Are these automatic or manual interlocking plants? A. Well, there is one at DeQueen that is automatic and one at Ashdown that is automatic.

Q. Both are automatic? A. Both are automatic.

Q. Mr. Blair, do you know how many public crossings, railroad with highway or street there are on your railroad in Arkansas? A. No, sir. Let me be sure I haven't already said this in my testimony here. I don't recall it. No, sir, I do not know.

Q. Mr. Blair, who is L. O. Frith? A. He is Executive Vice President of our lines.

Q. If Mr. Frith stated that there were one hundred and sixty-two public crossings on your railroad in Arkansas, then this would be a correct figure? A. I would accept it as being correct.

Q. You indicate that fifteen street or highway crossings are protected crossings, protected with automatic flashing light signals? A. At the time this testimony was prepared, that is correct. Others have been added. I do not know just how many but some have been added. They are added on a continuing basis as they qualify.

Q. Mr. Blair, are there any hotbox detectors located on your railway in Arkansas? A. No, sir, there are not.

Q. Are there any broken wheel flange detectors located on your railroad in Arkansas? A. No, sir.

Q. Are there any dragging equipment detectors located

on your railroad equipment in Arkansas? A. No, sir. I have never felt that they were of particularly any benefit.

Q. Have the locomotives used in freight service in Arkansas, are they equipped with the deadman pedal? A. Some of the locomotives are and if the requirements are such that they are to be equipped with the deadman pedal in operating in Arkansas, they are.

Q. If they are not required, then they are not so equipped? A. Well, our power is equipped with deadman equipment and with the alerters and the power is shifted around from place to place on our property from State to State and I think that some of the power could have the deadman feature removed where they are operated in multiple. I am trying to think now just what it is. I know that our passenger engines are equipped with the deadman feature and the power we bought had that feature on it to where I would say we would have to go to the record and on an individual basis for me to answer your question other than I have already answered it.

Q. Are your locomotives used in freight service in Arkansas equipped with either a deadman pedal or the alerter type automatic train stop system? A. Well, as I have told you previously that if the requirements of the law or the organization require that they be equipped with the alerter type or the deadman pedal, that they are so equipped. I can't recall right now just what the requirements are.

Q. It has to do with the speed at which the locomotive is operated, does it not? A. No, sir.

Q. It does not? A. No, sir. If I understood the question correctly.

Q. The requirement for a deadman pedal specifies that locomotives which are to be run at certain speeds or in excess of certain speeds must be equipped with the deadman pedal. Is this the nature of the requirement? A. Not to my recollection.

Q. Let me ask you this then. Are there any locomotives used in freight service in Arkansas by your railroad which are not equipped with either a deadman pedal or the alerter type automatic train stop device? A. Yes.

Q. All right, thank you. A. The booster units would not be equipped with it.

Q. Are any locomotives used in freight service by your railroad in Arkansas as the lead locomotive unit which are not equipped with either a deadman pedal or the alerter type train stop device? A. You said passenger service?

Q. No, sir, I said freight service? A. I have given you my answer to the best of my ability on that and the only way that I can answer you further is to make reference to my mechanical people as to what they are operating down there and what the requirements of the law are. We have bought our power with the deadman attachment on the power when it came from the factory and, if you wish for me to make a determination and answer your question, I will, sir.

Q. Mr. Blair, I am asking you what you know of your own personal knowledge and I take it from your answer that you do not know whether or not all locomotives use it as the lead engine unit in through freight service in Arkansas on your railroad are equipped with deadman pedal or alerter type train stop device? A. That is correct, sir.

Q. Thank you. Does your railroad have any track in Arkansas of the continuous weld type? A. Not that I know of, sir. I have not authorized the installation of any in Arkansas.

Q. Mr. Blair, at the bottom of Page 4, the paragraph at the bottom of Page 4; you indicate that your railroad makes use of the superior rail service for the purpose of inspecting your track in Arkansas and you state that "These inspections are made approximately each six

months through the entire State of Arkansas'' over your track? A. Yes, sir.

Q. Mr. L. O. Frith in an answer to an interrogatory stated in answer to the following interrogatory "How often is your entire mileage inside Arkansas inspected by the use of these cars equipped with rail defect detector equipment?" Answer "Approximately every six months, DeQueen, Arkansas north and approximately every eighteen months south of DeQueen, Arkansas." Which of you is correct?

Mr. Light: Would you state the date Mr. Frith responded to that interrogatory?

Mr. Ross: The response was subscribed and sworn to on the 9th day of September, 1966 and I believe your statement was subscribed and sworn to on the 26th day of August, 1966.

The Witness: I think my statement is correct.

By Mr. Ross: Q. One of you is incorrect though? A. It would appear so from the record. I am the operating man, however.

Q. Are any of your freight cars which are operated in Arkansas equipped with cast iron wheels? A. Cast iron wheels have been ruled out as of a certain date on a change out. As I recall it has not reached that point yet and so I would say the answer is yes, we do operate cars with cast iron wheels in the State of Arkansas.

Q. Do you operate any freight cars in Arkansas equipped with stem-winder type hand brakes? A. Not to my knowledge. I assume you mean the staff type?

Q. Yes, sir. Mr. Blair, do you know whether or not train accidents have increased or decreased on your railroad in the last four or five years? A. My best judgment is and without making any comparative analysis of it that we are having less accidents. We have been making an improvement as time has been progressing.

Q. You would say then in your opinion? A. In my judgment.

Q. The train accidents have decreased in the last four or five years? A. To my judgment, yes.

Q. What about crossing accidents? Do you have an opinion as to whether or not they have increased or decreased in the last four or five years on your railroad? A. In my judgment, we are having fewer crossing accidents now than we have had in the past. We have been making some improvement on that.

* * * *

Redirect Examination,

By Mr. Light:

Q. Mr. Blair, we have heard some testimony in this case about brakemen who ride short distances on trains in Arkansas in order to comply with the Full Crew Law. Are you familiar with that practice and that requirement? A. Yes, I am.

* * * *

Q. When you were a brakeman, did you ever perform the service of an employee riding a short distance in Arkansas to comply with the statute? A. I did.

Q. Where? A. From about two miles north of Springhill, Louisiana to Hope, Arkansas.

Q. Do you recall approximately that distance? A. About forty-six miles, forty-seven.

Q. And how would you return from Hope back into Louisiana? A. In an automobile or deadhead on a passenger train.

Q. When you served as the third brakeman on that run you have just described, what service did you perform on the train, Mr. Blair? A. I performed no service that could not have been performed by the other two brakemen and during the War when I was yardmaster at Cullen, Louisiana, to comply with the Arkansas Statute, I rode from Cullen mile post fifty on the L. and A. to Hope, Arkansas or to Stamps where delivery would be

made to the Cotton Belt Railroad and the car requirements would be such that the third brakeman was not required any longer in Arkansas and I would leave the train at that point.

Q. Over an approximate distance of what? A. It would be about twenty-four miles from Stamps in Arkansas back to the State line of Louisiana.

Q. In other words, you rode the train as long as it had twenty-five cars and when it dropped below that you left it? A. That is correct, sir.

* * * *

PLAINTIFFS' EXHIBITS NOS. 47-74—**Testimony of Various Individuals.**

[All Omitted from the Appendix, Except That the Following Statement was Prepared by Counsel for the Plaintiffs as an Introduction to the Booklet Containing Such Exhibits.]

PLAINTIFFS' EXHIBITS NOS. 47 THROUGH 74.

Summary of PX 47 Through PX 74.

The purpose of these exhibits is to show the manner in which railroad operations exempted from the crew consist laws are conducted in Arkansas.

Intrastate Railroads.

PX 47 through PX 63 are sworn statements describing the operations of the 17 intrastate railroads. Each owns or operates less than 50 miles of line and is therefore exempted from the statutory six-man crew requirement.*

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* While PX 67 reflects that two of the intrastate railroads have in excess of 50 miles of line, the reason these lines still enjoy exemption from the laws is explained in PX 47 and PX 48.

All are common carriers by rail, all interchange traffic with one or more of the plaintiff railroads and thus handle the same type of cars as do the plaintiffs, and all operate over public grade crossings. The climatic and weather conditions and geographic characteristics affecting these railroads are, of course, identical to those encountered by plaintiffs in their Arkansas operations. Motive power of these railroads is essentially similar to the diesel locomotives used by plaintiffs (except that one of the intrastate railroads still uses steam powered locomotives). Total railway operating revenues for these railroads in 1965 aggregated approximately $4,500,000 (PX 67).

Uninhibited by the statutory six-man crew requirement, these railroads operate with the following as their normal crew consist:

Number of Crew Members	Number of Railroads
2	2
3	4
4	5
5	4
6	2

Thus the normal crew of 15 of the 17 intrastate railroads is less than the statutory six men. The reasons (unrelated to any requirement for safe train operations) that a six-man crew is employed on two of these railroads are given in PX 55 and PX 60.

These exhibits also reflect that these operations with smaller crews have not resulted in injuries to crew members or the public that could have been averted with larger crews.

Interstate Railroads.

PX 64 pertains to the only interstate railroad operating in Arkansas with less than 50 miles of line and thus ex-

empt from both of the laws involved in this suit. It employs a four-man crew.

PX 65 and 66 pertain to the only two railroads operating in Arkansas that have between 50 and 100 miles of line and are therefore subject to the freight crew law but not the switch crew law. Both are interstate carriers, and operate in Louisiana with crews of no more than five men. However when any train is operated into Arkansas with more than 24 cars additional crewmen are added to bring the total to six. While both are exempt from the switch crew law because they have less than 100 miles of line, both must necessarily perform switching operations in Arkansas with six-man crews since all switching is done in this State with the freight crews.

PX 67 supplies statistical data pertaining to the operations of all railroads in Arkansas.

Industrial Rail Operations.

PX 68 through PX 73 pertain to the operations of six industrial rail facilities in Arkansas. Three of these employ a two-man crew, one employs a crew that varies from two to three, and the other two have crews of three and four, respectively. All interchange traffic with one or more of the plaintiffs and operations are conducted under circumstances substantially similar to those encountered by plaintiffs in their Arkansas operations.

Military Rail Operations.

The United States Government operates rail facilities at the Little Rock Air Force Base and the Pine Bluff Arsenal. PX 56 and PX 74 reflect that these are conducted with crews of three men.

* * * *

PLAINTIFFS' EXHIBIT NO. 75—
Testimony of Charles P. Battaile.

INTERVENORS' REBUTTAL EXHIBIT NO. 75—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 76—
Testimony of H. L. Buckner.

INTERVENORS' REBUTTAL EXHIBIT NO. 76—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 77—
Testimony of R. W. Troth.

INTERVENORS' REBUTTAL EXHIBIT NO. 77—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 78—
Testimony of James E. Wolfe.

My name is James E. Wolfe. I am Chairman of the National Railway Labor Conference with headquarters at Chicago, Illinois.

I entered the service of the Burlington Railroad in the spring of 1918 when I was 16 years old as a coal chute laborer at Hannibal, Missouri. During my employment by the Burlington Railroad I worked as a machinist's helper, machinist, yard clerk, chief yard clerk, switchtender, switchman, chief timekeeper, assistant yard-

master, yardmaster, supervisor of wage schedules, as an officer on the staff of the executive vice president, and as assistant to the operating vice president.

On February 1, 1952, I was made Assistant Vice President. In June 1957 I became Vice President in Charge of Personnel—which position I held until November 1961, when I became Chairman of the Committee on Labor Relations of The Association of Western Railways and Chairman of the Western Carriers' Conference Committees.

From 1952 until my appointment to my present position, I served as a member of all Western Carriers' Conference Committees handling concerted national and regional wage and rules movements on behalf of the American railroads.

I was a member of a committee of six railway executives established by 200 cooperating railroad companies in December of 1957 to investigate and report upon the manner in and the degree to which agreements, rules, regulations, interpretations and practices governing the employment and working conditions of railroad employees were affecting the financial condition and competitive position of the railroad industry, the efficiency of railroad operations, the character of railroad service and the national interest; and to make recommendations as to what procedures should be followed to correct such abuses and inequities as were found to exist. As a member of that committee, I supervised the preparation of the carriers' notices and proposals which were later referred to the Presidential Railroad Commission; and in all subsequent proceedings, involving the Carrier notices of November 2, 1959, I acted as chairman of and spokesman for the Joint Carriers' Conference Committees of the Eastern, Western and Southeastern districts.

I was appointed by the President of the United States as a member of the Presidential Railroad Commission and served as a member of that Commission, and as

spokesman for the carrier members of the Commission, until it completed its work and was dissolved pursuant to the order of its creation, on March 26, 1962.

I was a member of Arbitration Board No. 282, created pursuant to the provisions of Public Law 88-108, which was approved by the Congress on August 28, 1963. In that capacity, I participated in the sessions of the Board subsequent to the rendition of its award involving interpretations of various provisions of the award.

The award of Arbitration Board No. 282 contained a provision for a study of the experience of the railroads relating to operations in freight and yard service with and without firemen. The award provided that the parties were to establish a national joint board charged with the responsibility for making an extensive and continuing study of the experience of the carriers in freight and yard service with and without firemen during the period that the award was to remain in effect. It was also provided that during the three month period before the expiration of the award, the National Joint Board was to prepare and issue a report covering the results of its studies. The National Joint Board contemplated by the award was to consist of four members, two selected by the carriers, one selected by the Brotherhood of Locomotive Firemen and Enginemen and one selected by the Brotherhood of Locomotive Engineers. I was one of the carrier members of the National Joint Board established pursuant to the award. I participated in the studies which preceded the report of the National Joint Board, and I also assisted in the preparation of the Board's report. The report which the Board issued on January 5, 1966, is reproduced as Exhibit 79. The report, Part I, describes the events which preceded the establishment of the National Joint Board, the scope of the Board's work, and the nature of its operation. Part II of the report is devoted to the Board's studies regarding the possibility of undue work burden placed upon the remaining members of the crew following

the elimination of fireman positions in freight and yard service under the terms of the award. Part III of the report describes the Board's studies of alleged employee hardship resulting from the award insofar as earnings and earnings opportunities and living and working conditions are concerned, as well as the situation of the firemen separated from the service.

Part IV of the report of the National Joint Board is devoted to the studies of safety of operations in freight and yard service with and without firemen. It is of particular significance that the studies made by the Brotherhood of Locomotive Engineers on the question of safety of operations disclose that it was the consensus of its officers, representatives, and members that the elimination of firemen's jobs has not adversely affected the safety of railway operations. Studies made by the carriers reached the same conclusion. The report of the National Joint Board also considers in some detail the contrary claims made by the Brotherhood of Locomotive Firemen and Enginemen. It is interesting to note in this respect that the representative of the Brotherhood of Locomotive Firemen and Enginemen on the National Joint Board failed to attend the opening meetings of the Joint Board and thus, did not participate in the thorough discussion of railroad operations with and without firemen which took place at such meetings. The Board's report is detailed and does not require any extended explanation. I do, however, wish to emphasize again the fact that in January of 1966 the Brotherhood of Locomotive Engineers, representing the members of the engine crew who continue to work in freight and yard service in the absence of firemen, concluded that there was no evidence that the absence of firemen had any adverse effect on safety of operations. As the remaining members of engine crews in freight and yard service, the engineers have the most immediate and direct interest in safety of such operations. The Brotherhood of Locomotive Engineers,

representing such employees, had had a period of almost two years to study operations without firemen and it undertook to make its study as geographically representative as possible by including at least four railroads from each section of the United States and Canada. Thus, three out of the four members of the National Joint Board, after detailed analysis of available experience, concluded in effect that firemen make no contribution to safety of operations in freight and yard service.

The award of Arbitration Board No. 282 also dealt with the matter of the size of train crews in road and yard service. The relevant provisions of the award appear in Section III, headed "Consist of Road and Yard Crews." On this issue the Board's award provided that the use of trainmen in all classes of road service and the use of brakemen or helpers in yard, transfer, belt and miscellaneous services would be governed by the rules in effect immediately prior to the effective date of the award except that crew sizes differing from those specified in such rules could be established under the procedures contained in Section III. In road service, the award provided that either party in interest, that is, either the organizations representing employees or the carrier, could give written notice of any proposed change in the number of trainmen used in road service where existing rules, practice, or interpretation required the employment of more or less than two trainmen, except that in branch line service changes in consist could be proposed without any such limitation. In yard service the award also provided that changes in the number of brakemen or helpers used could be proposed by either party in interest, again without regard to the size of crews required by existing rules. In substance these provisions of the award gave the organizations or the carriers the right to undertake to change the size of crews in branch line service or yard service regardless of the number of brakemen or helpers required by existing rules, while the right to change the size of crews

in other road service was limited to situations where existing rules require the employment of more or less than two trainmen. Thus, in road freight service, rules requiring the use of two brakemen could not be modified under the terms of the award but rules requiring the use of three brakemen were subject to modification. Similarly, rules requiring fewer than two brakemen could be modified and specific requirements could also be proposed where existing agreements contained no rules on the subject of crew size. If the parties were unable to agree upon the terms of the proposed changes, the award provided that special Boards of Adjustment would be established to make final and binding determinations as to the size of crews to be used in road or yard service. The award specified the manner in which the Board should be established and also provided a list of detailed guidelines which were to govern the Special Boards in their consideration of the proposals of the parties. The very first guideline, and one which received the most careful attention by the Special Boards of Adjustment was "assurance of adequate safety." Pursuant to these provisions of the Award of Arbitration Board No. 282, a large number of Special Boards of Adjustment were established on individual carriers. Each of these boards rendered final and binding awards which established the size of train crews in road and yard service. The National Railway Labor Conference of which I am Chairman undertook to collect all of the awards rendered by these Special Boards.

I have reproduced a number of these awards in the volume marked Exhibit 80. The awards which I have reproduced were selected for the purpose of illustrating the careful consideration given by these Special Boards to the question of safe operations in road and yard service with crews much smaller than those required by the Arkansas statute. Generally, these awards indicate that the neutral chairmen, appointed by the National Mediation Board, were most attentive to the guideline pre-

scribed by Arbitration Board No. 282. The individuals serving as neutral chairmen on these various Special Boards were highly qualified for the positions to which they were appointed. Generally, these individuals had had prior experience in the railroad industry as arbitrators, members of presidential emergency boards, or referees in proceedings before the National Railroad Adjustment Board. Their academic backgrounds, and their familiarity with railroad operations, as well as their prior experience in the determination of railroad labor disputes, provided these various individuals with the knowledge and insights required for a proper consideration of the guidelines prescribed by Arbitration Board No. 282. Consequently, the substance of the awards is of substantial value in determining whether crews of a given size are adequate for safe operations in freight and yard service and the corollary question as to whether crews of a specified size are larger than necessary for safe operations in freight and yard service.

In order to present in summary form the results of the awards of the many Special Boards of Adjustment, acting pursuant to the Award of Arbitration Board No. 282, I have had prepared a series of tables which are attached to my statement as Exhibits 1, 2, 3, 4, 5, and 6. Exhibit 1, consisting of seven pages, summarizes the awards to which the Brotherhood of Railroad Trainmen was a party. With respect to each award, the summary shows the name of the railroad, the neutral referee, the number of days devoted to hearings and observations by the Board, the number of witnesses and exhibits, the number of transcript pages, and the date of the award. Data regarding the effect of the award appears in columns 13 through 19 of the summary. In those columns the summary shows the class of service, the number of trainmen required per crew under prior rules, the number which the railroad proposed to use, the number of crews covered by the railroad proposal, the number of crews

as to which the Board sustained the railroad proposal, and the number of jobs eliminated. Page 6 of Exhibit 1 is a recapitulation of the preceding five pages in which we have tried to summarize the comprehensive detail appearing on the prior pages. The bottom half of the page contains a series of figures showing the effect of all changes in crew size resulting from the awards of the Special Boards created to resolve disputes between the Brotherhood of Railroad Trainmen and the various carriers listed on the preceding five pages. The final entries show that in all classes of service the awards of the Special Boards resulted in reduced crew sizes for 4,076 crews. The vast majority of these crews were reduced to one trainman. Thus, as shown in Column 26, 3,335 crews in all classes of service were reduced to a consist of one trainman, 670 were reduced to a consist of two trainmen and 68 were reduced to a consist of no trainmen, the crew being composed of a conductor without any trainmen or helpers. Only 80 of these crews were in passenger service. Consequently, approximately 4,000 crews covered by the awards of the Special Boards were working in the classes of service subject to the requirements of the Arkansas statute. Exhibit 2 shows the same kind of detail with respect to the awards involving the Switchmen's Union of North America. Page 2 of Exhibit 2 is a recapitulation which shows that 602 crews were involved in the awards rendered by the Special Boards. Of these 602 crews, 585 were reduced to one helper, 14 were reduced to two helpers and three were reduced to a conductor or foreman without any helper.

In addition to the changes in crew size, resulting from the awards of Special Boards, there have been many agreements accomplishing this same objective during the period of time in which the award of Arbitration Board No. 282 was in effect. These agreements generally were entered into by the parties in lieu of proceedings before

Special Boards in accordance with the provisions of the Award of Arbitration Board No. 282. In other words the agreements were reached after notices were served under the provisions of the award but before an impasse had been reached requiring resort to a Special Board. I can not emphasize too strongly the fact that these were voluntary agreements and thus represent the considered judgment of the organizations as to the size of crew adequate for safety of operations in road and yard service. Exhibit 3 to my statement summarized the agreements to which the Brotherhood of Railroad Trainmen was a party. The summary page shows that the Brotherhood of Railroad Trainmen entered into agreements with the various identified railroads which involved 3,121 crews. Under the terms of these agreements, 2,175 crews were reduced to one trainman while 926 crews were reduced to two trainmen. Only 12 of the crews involved were employed in passenger service.

The same detail is shown for agreements involving the Switchmen's Union of North America on Exhibit 4. That exhibit shows that nine crews were involved and that seven were reduced to a two-helper consist while two were reduced to a one-helper consist. Exhibit 5 is a summary which combines the data for Special Board awards and agreements involving the Brotherhood of Railroad Trainmen while Exhibit 6 combines the same data for the Brotherhood of Railroad Trainmen and Switchmen's Union of North America. Referring to the totals appearing in Exhibit 6 the first line under the heading "Number of Crews the Consist of which was Reduced" shows that three crews were reduced from a consist of four helpers in yard service to three helpers; 1,617 crews in all classes of service were reduced to two trainmen or helpers from prior requirements of five, four, or three trainmen or helpers; 6,100 crews were reduced to a consist of one trainman or helper while 88 were reduced to a consist of

no trainmen or helpers. A total of 7,808 crews were reduced in size under the Special Boards awards and pursuant to the agreements to which I have referred. Virtually all of these crews were reduced to sizes smaller than the crew size required by the Arkansas statute.

One of the most interesting features of the awards of these Special Boards is the absence, with one or two exceptions, of any proposal by the labor organizations involved, the Brotherhood of Railroad Trainmen, the Order of Railway Conductors and Brakemen and the Switchmen's Union of North America, to require the use of the three brakemen in road service or three helpers in yard service. Under the Award of Arbitration Board No. 282, the organizations, of course, were free to propose crews of that size. Although virtually all of the rules in yard service which were subject to modification by the carrier proposals required two rather than three helpers in yard service, the disputes referred to the Special Boards were whether the requirement of two helpers should be retained or whether the requirement should be reduced to one helper or in some instances, no helpers. In road service, the same situation prevailed. Although the organizations were free to propose the use of three brakemen where existing rules required two or less, no such proposal was made by any of the labor organizations in all of the many Special Board proceedings summarized in exhibits 1 to 6 with one or two exceptions.

One other feature of the awards of these Special Boards which is of particular interest here relates to the guideline contained in the Award of Arbitration Board No. 282 involving switching across highways, streets, or other crossings. The guideline to which I refer is C (2) (h) which requires the Special Boards to give consideration to "the number of highway, street, road, railroad or other crossings or intersections to be protected." Each Special Board of Adjustment in passing on proposals with respect

to the size of yard crews was required to and did take into consideration the guideline which I have just quoted. As I have stated, the general result of the awards, taking into account this guideline among others and giving particular consideration to assurance of adequate safety, was to authorize the carriers to reduce yard crews to a consist of a foreman and one helper. Typical of the consideration which the Special Board gave to the necessity of making moves across highways and street crossings was the discussion of that point by the Special Board of Adjustment on the Rock Island which rendered an award dated November 20, 1966, permitting the Rock Island to reduce 72 crews to a consist of a foreman and one helper. The opinion of the Neutral Chairman appears at pages 37 to 124 of Exhibit 80. Referring to the testimony of the union witnesses, the Chairman of the Board stated:

> "Practically every Union witness described in searching detail the number of roads, streets, highways, and other crossings traversed by Rock Island tracks. No need exists to detail their testimony in this respect, since the common burden of such testimony was that crossings must be protected by a switchman, and, therefore, to assure adequate protection at such crossings the jobs in question should not be reduced."

The Chairman then referred to Rule 103 of the Uniform Code of Operating Rules, in effect on virtually every railroad in the United States which provides as follows:

> 103. Switching over Public Crossings at Grade. When cars are shoved, kicked or dropped in switch movement over a public crossing at grade, a member of the crew must protect the crossing from a point on the ground at the crossing and each movement over crossing must be made only on his signal, **except** that such protection is NOT required:

(1) When crossing is protected, on track being used, by a watchman, gates or manually controlled crossing signals, and they are known to be functioning.

(2) When cars are shoved over crossing and facing end of leading car is equipped with a back-up air brake hose or pipe, and air whistle handled by the trainman.

(3) When yard to yard or long switch or transfer movement shoving cars are protected by a member of the crew on leading car and movement over the crossing is made only on his signal.

The Chairman continued his discussion of the matter stating:

"What Rule 103 amounts to is this—When a train is shoved (not pulled) across a crossing, the crossing must be protected if there are not warning bells, or watchmen, or gates. Thus, a crossing must be protected if a shove is made across a crossing which is only protected by a 'cross-buck.' Now the question is this: with a two-man crew consist would there be adequate protection of crossings as required by Rule 103? The best evidence in this regard is the experience with the 73 two-man crews currently operating on the Rock Island property, and which have been operating on this basis for about one year. Clearly, the jobs of these two-man crews require crossings of highways, streets and the like.

"Not one scrap of evidence was submitted to this Special Board to demonstrate that there has been the first accident at crossings as these two-man crews performed their jobs. In the light of this experience, it is quite clear that Rule 103 can be complied with when jobs are operated with a two-man crew. True, members of such crews may be required to flag more times, but proper protection at crossings may be provided

with the operation of jobs with a two-man crew consist. How else should the Chairman regard the successful operation of the two-man crews in this regard over the past year? And what about the agreement which the Union made with the Central of Georgia Railway Company? Unless that carrier is unique in the railroad industry, the two-man crews specified in this agreement have apparently successfully protected crossings.

"On this basis, the Special Board finds that the jobs listed in the Carrier's Notice of July 23, 1965, may be reduced by one helper within the meaning of Guideline C (2) (h)."

Since the Arkansas statute requires a crew of six, including a foreman and three helpers on yard crews which "do switching, pushing or transferring of cars across public crossings within the city limits of the cities" in which such crews operate, the repeated determinations by the Special Boards that such switching can be safely done by crews of a foreman and one helper is of particular significance.

Although the Arkansas statute requires the use of three brakemen in freight service and three helpers in yard service under the circumstances specified in the statute, the Brotherhood of Railroad Trainmen which represents most of the brakemen in road service and most of the foremen and helpers in yard service, is currently proposing under Section 6 of the Railway Labor Act that the railroads enter into agreements requiring crews consisting of a conductor and two brakemen in road service and a foreman and two helpers in yard service. This proposal, of course, seeks crews which are smaller than those required by the Arkansas statute. Specimen copies of this notice are reproduced as Exhibits 7 and 8 to this statement.

[Exhibits to Testimony Omitted from Appendix.]

INTERVENORS' REBUTTAL EXHIBIT NO. 78—

Cross-Examination,

By Mr. Ross:

Q. State your name and address, please sir? A. James E. Wolfe, 20026 Holmes Avenue, Clarendon Hills, Illinois. My office is in the Chicago Union Station Building, Chicago, Illinois.

Q. Mr. Wolfe, you are presently Chairman of the National Railway Labor Conference? A. I am.

Q. What are your duties in that position? A. I am chief spokesman for practically all of the railroads of the Nation and I handle all matters involving labor at the National level.

Q. You represent the carriers then in labor negotiations at the National level? A. Yes, I do.

Q. In performing these duties, what type of negotiations do you enter into? A. Well, I think all kinds of negotiations. I deal with the chief executives of the unions with which our railroads have contractual relations, on many occasions with the representatives of the chief executives. We handle all concerted movements. We administer the affairs of the National Railroad Adjustment Board and we handle everything that is related to labor at the National level.

Q. Mr. Wolfe, you were a member of the committee which drafted the November 2, 1959 notices, were you not? A. Yes, I was.

Q. Those notices among other things requested reductions in rates of pay of some employees by as much as thirty-seven and a half percent. Is that correct? A. No, that is not correct. The notices we served in regard to the dual basis of pay contemplated an expansion of the mileage factor of that basis of pay from one hundred miles to one hundred sixty miles.

Q. This would in effect reduce the rates of pay for those employees concerned, would it not? A. In our opinion it would not. By adding a few hours of service and still

working less than the normal forty hours a week work, normal earnings could have been maintained and I believe our records before the Presidential Railroad Commission conclusively prove that to be a fact.

Q. These notices did request a reduction in the rate per mile paid to certain employees, did it not. A. No, they did not. The notice simply would have expanded the basic pay from one hundred miles to one hundred sixty. If the length of the run in miles was one hundred miles or less, then everything would have remained static. There would have been no difference whatever.

Q. On those runs of more than one hundred miles, the rate per mile rate of pay for the employees per mile would have been reduced, would it not? A. Well, it depends on how you approach it. If the run was exactly one hundred sixty miles, the daily rate would have been paid, the rate that was in effect at that time. The record showed, as I recall, that the average time on duty was in many cases far less than one half the normal work week.

Q. These notices of November 2nd, 1959 also requested the elimination of collective bargaining controls from virtually all of the freight and yard manning, did they not? A. No, they did not. This did not touch upon that subject at all. That was alleged by certain people who didn't know what they were talking about but we were not trying to remove anything from the realm of collective bargaining. In fact, our notice contemplated that there would be bargaining in order to make our proposals effective and that consideration could be given to the counter proposals of the unions. It was a collective bargaining venture.

Q. Mr. Wolfe, on page 509 of the report of the Presidential Railroad Commission there is what purports to be the substance of the portions of the November 2nd, 1959 notice. This is entitled "Use of Firemen (Helpers) on other than Steam Power (A) Eliminate all agreements, rules, regulations, interpretations and practice however established applicable to any class or grade of train engine

or yard service employees which require the employment or use of firemen (helpers) on other than steam power in any class of rate service (including all mixed, miscellaneous and unclassified services) or in any class of yard service (including all transfer belt line and miscellaneous services to which mileage rates do not apply)". Does not this or does this accurately represent the contents of the November 2nd notices as it applies to freight and yard manning, the manning of trains in freight and yard service? A. It does. That was the notice that was investigated by the Presidential Railroad Commission by Emergency Board No. 154 and by Arbitration Board 282.

Q. Did this not eliminate or propose the elimination of collective bargaining controls? A. No, sir, it did not.

Q. Section B of that same page, a continuation of these proposals "Establish a rule to provide that one, management shall have the unrestricted right under all circumstances to determine when and if a fireman (helper) shall be used on other than steam power in all classes of freight service (including all mixed, miscellaneous and unclassified services) and in all classes of yard service (including all transfer, belt line and miscellaneous services to which mileage rates do not apply)". Would not this proposal eliminate collective bargaining controls? A. No, sir, it would not. The rule that we intended to supersede required a fireman on every type of locomotive. Now, we did not consider that that part of a rule removed the subject from the area of collective bargaining. In fact we sought to bargain it away.

Mr. Lucente: I have made no objection at this point to the interrogation on the November, 1959 notices on the grounds that there aren't any issues raised by the complaint which in anyway relate to the notices there by the character of November 2nd, 1959. I have refrained from objecting so far but I think if we are going to spend most of the day pursuing those notices, we are going to be wasting everybody's time.

Mr. Ross: Mr. Wolfe was a member of the committee it so states in his statement or exhibit.

Mr. Lucente: Mr. Wolfe described his experience in the industry but I doubt if every facet of that experience is relevant to this particular litigation.

By Mr. Ross: Q. Mr. Wolfe, these questions are asked over counsel's noted objections. These notices of November 2nd, 1959 requested the elimination of most collective bargaining controls regulating the nature and scope and length of assignments, for instance, from combining road and yard work. Is that true? A. No, sir, it is not.

Q. These notices proposed the elimination of existing controls over extending road assignments, did they not? A. No, sir. The notice did no such thing. We did ask for greater freedom in the establishment of inter-divisional operations but our notice contemplated that if we failed to agree upon certain very pertinent factors, it would be submitted to arbitration.

* * * *

Q. Mr. Wolfe, these proposed notices would remove controls over craft limitations on work performed, would they not? A. No, sir, they would not.

Q. Mr. Wolfe, you refer on Page 3 to being appointed by the President of the United States as a member of the Presidential Railroad Commission. Your name was furnished to the President by the Carrier as one of their representatives on the Presidential Railroad Commission, was it not? A. I was nominated by the railroads and appointed by the President.

Q. But you were nominated then by the railroad corporations which you represent? A. Yes, just as the labor unions nominated their members of the Commission and they were appointed by the President.

Q. You also served as a member of Arbitration Board 282? A. Yes, sir.

Q. And you were chosen by the carriers for this position, were you not? A. Yes, public law 88108 was stipu-

lated that the unions would name two members and the carriers would name two members and I was selected by the carriers as one of those members.

Q. And on that board you actively represented the carriers as an arbitration board member? A. Yes, sir, I did.

Q. As a member of that Board, you don't pretend that you were an unbiased or neutral participant, do you? A. I would argue vigorously that I was without bias, but I did to the best of my ability represent my principals.

Q. You were an advocate for the carriers' position, were you not? A. I was a member of the Board to carry out all of the functions of the Board. On occasion I was a very strong advocate for the union if I thought they were in the right.

Q. Could you give me one instance in which you were a very strong advocate for the union? A. Yes, I positively can. The public members in regard to employees with dual seniority, that is seniority——

Q. What kind of seniority? A. I referred to that as dual. I will change that to multiple. They had seniority on more than one seniority district. The public member suggested in answer to a question I didn't think it was right. I thought it would cause injury to certain employees and thus cause me trouble and Mr. Gilbert, one of the union members of the Arbitration Board, myself, worked out something that in my opinion proved to be much more equitable to the employee.

Q. Do you recall any other occasion in which you were a strong advocate for the union position? A. Upon many occasions, if I thought it was wrong, based upon my practical experience, I joined with Mr. Gilbert and Mr. McDonald.

Q. Do you recall any other specific instance in which you advocated the union position? A. Well, there were many questions that were submitted to the Reconvened Board where Mr. Gilbert and I actually wrote the answer without the assistance of the public members.

Q. In speaking of the original Presidential Railroad Commission—pardon me—I am speaking of the original Arbitration Board 282, the proceedings before that Board prior to its reaching or rendering an award? A. Now, you have reference to Arbitration Board 282?

Q. Yes, sir. A. Insofar as what many people considered an overly generous protective features of the award, I defended the recommendation of the Presidential Railroad Commission. Many of those recommendations were adopted by Award 282 even though I felt that we went entirely too far in our generosity, far beyond anything that had ever been done in this country or any other country of which I have knowledge.

Q. You might make these same statements insofar as those things which were taken away from the organizations by this same Board, might you not? A. I don't know whether you are asking a question or making a statement but I don't know of anything that was taken away from an individual, from a man who works, from one of the laboring people. I had no inclination to act as an advocate for an institution if that is what you have in mind. The men who labor, the men who work were treated fairly and I wanted that to take place.

Q. Mr. Wolfe, from 1957 you were Chairman of the Committee on Labor Relations of the Association of Western Railroads? Is that right? A. I assumed that position on November 1, 1961.

Q. I see. What were your duties in this position? A. I was Chairman of the Carrier's Conference Committee representing the Western Railroads and I was also Chairman of the Committee for Labor Relations for the Western Railroads. As Chairman of the Negotiating Committee, we referred to it as the Carrier's Conference Committee, I represented the Western Railroads in all negotiations at the Regional and National level. The Committee on Labor Relations was a policy committee for the Western Railroads.

Q. And you represented the carriers' position during your negotiations with the organizations? A. Yes, sir. Ordinarily where a National issue confronted us, the three regions would band together to represent all of the railroads of the Nation.

Q. In your duties as Vice President for personnel or in Georgia personnel on the Burlington Railroad, I assume you represented that railroad in its negotiations with the labor organizations? A. Yes. The negotiations on the property and in addition I handled many other things for the Burlington, safety, our own insurance and the employment department and many other things directly or indirectly involving employee relations problems.

Q. Mr. Wolfe, if you will confine your answer to the question which I ask, I think we will save some time. In your position as assistant Vice President, were you also concerned with the negotiations with the labor organizations? A. Yes.

Q. As a member of the carriers' conference committee, you were an active participant before a number of emergency boards? A. I was.

Q. Including Emergency Board 116, 114 and 130? A. I do not recall.

Q. I believe you refer to Mr. E. H. Hallman being the other carrier representative on the Joint Board. Who is Mr. Hallman? A. Mr. Hallman was a former director of personnel or manager of personnel of the Illinois Central Railroad Company.

Q. You were also associated with Mr. Hallman in testifying before the Senate Commerce Committee, were you not, in 1965? A. I do not recall whether Mr. Hallman testified or not. I did.

Q. Do you recall Mr. Hallman reading your statement to the Senate Committee in the Summer of 1965? A. I see you have finally made it clear—that wasn't 1965, that was 1963.

Q. You were associated with Mr. Hallman in testifying before that committee in 1963 then? A. Yes. Have you got it straight, it is 1963 instead of 1965?

Q. Yes, sir, I have that date. Mr. Wolfe, in the Summer of 1965, there was a Senate Committee investigation as to the aftermath of the award of Arbitration Board 282. Did you participate or did you appear before the Senate on that occasion? A. I appeared before that subcommittee of the Senate Committee on Foreign and Interstate Commerce when that committee decided to exercise its legislative oversight function. I am not exactly certain as to the date. It was, however, in 1965.

Q. Do you recall addressing a letter to the chairman of the Senate Commerce Committee, Senator Magnison on May 15 of 1965? A. I do not recall whether I did or did not. If there is a letter, I probably did.

Q. Mr. Wolfe, I hand you what purports to be a letter to Senator Magnison dated May 15, 1965. Would you see if you can identify that letter, please sir? A. Yes, that is my letter.

Q. Mr. Wolfe, is there attached to that letter a document entitled "Reply to Gilbert letter of April 5, 1965"? A. There is.

Q. Is this a document which you prepared or had prepared? A. It is.

Q. For the purpose of presenting it to that committee? A. It is.

Q. Were certain statistical comparisons presented in that document from which you drew the inference that removal of firemen from locomotives would not impair railroad safety? A. There is.

Q. Do you know that the comparisons relied on here were comparisons of preliminary and incomplete figures for the period after firemen had been removed with complete information for the earlier period with which it was compared? A. Well, I'm quite certain that some of the information we used may have been preliminary

because the final was not available. I think that same thing is true of statistics presented to this committee by Mr. Homer.

Q. May I have that back, please sir?

(The witness passed the document back to Mr. Ross.)

Q. Mr. Wolfe, on page 64 of plaintiffs' exhibit 79 which is one of the exhibits to your statement I believe? A. Yes.

Q. The first paragraph under the heading "Safety of Operations" or subheading "Preliminary Statement" and then beginning "Under date of June 11, 1965, the Chairman of the Interstate Commerce Commission informed the Chairman of the Committee on Commerce, United States Senate, that since the implementation of public law 88-108 by the railroads the Commission had investigated no accident in which it was found that the absence of a fireman was a contributing or the proximate cause. This was reaffirmed by Mr. John W. Bush, Acting Chairman of the Commission, when he testified before the Committee on Monday, August 30, 1965, and no report of any such accident has been made to the date hereof. The Acting Chairman testified on August 30 that during the period since May 1, 1964, the Commission had completed the investigation and issued reports covering twenty-three accidents, nine of which involved the operation of a locomotive without a fireman." Mr. Wolfe, have you read that paragraph? A. What paragraph?

Q. The first paragraph on page 64? A. I will read it. I have read it.

Q. In the testimony referred to as being that of the Active Chairman, Mr. Bush, there was the statement that the Commission had completed the investigation and issued reports concerning twenty-three accidents. How many accidents, how many train accidents had occurred during that period? Do you know? During the period covered by—well, during 1964? A. I do not know.

Q. You do not know what proportion the twenty-three accidents would be of the total accidents which occurred? A. No. All we did was comment on those that had been investigated.

Q. Mr. Wolfe, in the 79th Annual Report of the Interstate Commerce Commission under Appendix E, Table 1, Railroad Grade Crossing Accidents, the total number of train accidents in 1964 was five thousand, three hundred and seventeen?

Mr. Light: Is that a question?

Mr. Lucente: Is the document in evidence to which you refer? I suggest you put the facts in when you put in your case instead of trying to put them in through Mr. Wolfe.

By Mr. Ross: Q. Mr. Wolfe, in "Accident Bulletin No. 1, Page 3 of the Interstate Commerce Commission" the total of train service accidents were listed for 1964, were listed as seventeen thousand, five hundred and fifty-nine. The total of the train accidents and the train service accidents according to these figures were twenty-two thousand, eight hundred and seventy-six. You were a member of the Joint National Board, were you not? A. I was.

Q. You participated in including this preliminary statement of Mr. Bush's concerning these twenty-three accidents in this record, I assume? A. Now, are you still referring to our letter to Chairman Magnison? A. No, I am referring to the first paragraph on page 64 of the National Joint Board, the report of the National Joint Board? A. The report of the National Joint Board was the work of the majority members of that Board and as such I participated in its preparation.

Q. You were the Chairman of the National Joint Board, were you not? A. No, sir, I was not. It was composed equally of partisan members. We did not have a chairman.

Q. Mr. Wolfe, this was a relatively insignificant number of accidents out of the total accidents which occurred

in 1964 on which this study was based, was it not? A. Well, I do not believe I am competent to say whether it was significant or insignificant and I am going to take the liberty of trying to explain to you for the record why I make that statement. The Interstate Commerce Commission has the statutory duty to conduct those investigations and whether they think it is significant or insignificant, I have no way of ascertaining.

Q. Would you say in your opinion that a study of twenty-three accidents out of a total of twenty-two thousand, eight hundred and seventy-six would have any significance?

Mr. Lucente: Mr. Wolfe has already answered that question. That is the same question you just asked him.

Mr. Ross: No, it was not. I believe this was a different question. I am asking him if in his opinion at the present time whether this study of twenty-three accidents out of a total of twenty-two thousand, eight hundred and seventy-six would have any significance in your opinion.

The Witness: I am going to try to answer that question to the best of my ability. The Interstate Commerce Commission has had the obligation imposed upon it by Congress to conduct such investigations as it considers are necessary or essential to performing its duty. It must have some basis of selectivity. On that premise, I would not say it is insignificant.

Q. Mr. Wolfe, I don't believe you have answered my question yet. Let me ask you this: Do you have an opinion, a personal opinion, on the significance of an investigation of twenty-three accidents out of a total of twenty-two thousand, eight hundred and seventy-six? A. I do not think that it is insignificant. My conclusion would be on the basis of the long experience of the Interstate Commerce Commission that that body considers it significant and I will not disagree with it. That is my personal opinion and I believe it is directly responsive to your question.

Q. Mr. Wolfe, if Mr. Bush, who was the Acting Chairman of the Commission at the time felt that it was insignificant or not too meaningful, would you agree with him? A. Not necessarily nor does that mean that I would disagree with him. I have no idea what motivated his comment.

Q. Were you present when Mr. Bush testified before the Senate Committee of Commerce on August 30th, 1965? A. I was not.

Q. Have you read a report of those proceedings? A. Not all of it.

Q. Are you aware from what reading that you have done of this report that Mr. Bush agreed with Senator Cannon that the study of this limited number of accidents was not too meaningful? A. I did not read it and am not prepared to make a comment on such a statement if it is in there.

Q. Mr. Wolfe, in the paragraph I referred to on page 64? A. Yes, sir.

Q. It indicates that Mr. Bush's testimony was on August 30, 1965. The report of the National Joint Board in which this paragraph is included was on January 5, 1966? A. Yes, sir.

Q. Is that correct? A. That is correct, yes, sir.

Q. Mr. Wolfe, in the light of your background of knowledge of the railroad industry, don't you know that some accidents and casualties have occurred in railroad operations without firemen that would not have occurred had the firemen been present? A. I do not know of such a single instance and I do not believe there are any, not a single one.

* * * *

By Mr. Lessenberry: Q. Mr. Wolfe, I want you to feel free to elaborate if you feel that it is necessary to clarify some of the answers to my questions. A. All right, sir.

Q. As a member of the Arbitration Board 282, do you know if there were any special Boards of Adjustment

that participated in regard to particular problems in Arkansas? A. I know that there were Boards involving the railroads that operate in Arkansas. As to the scope of their investigation, I'm not certain.

Q. If I'm not mistaken I believe that these Special Boards only considered the problems that might have been apparent at Paragould, Arkansas, and North Little Rock. Do you know if there was anything other than those two? A. I do not know. I have the records available here but I would not want to say yes or no without examining those records. We had a great many boards and it is impossible for me to keep all of the details in my mind but if I may elaborate, I know that were questions involving Boards in States that had existing excess crew laws and on several instances the neutral conducted his study in those States over the objections of representatives of the union even though the result was academic because the carrier could not relieve it of redundant employees as a result of the award.

Q. And when you refer to excess crew laws you are referring to crews that have been set or established by Legislative bodies other than by collective bargaining, aren't you? A. Yes, sir.

Q. I take it you don't agree with the proposition that there is a certain element of State interest in the size of railroad crew consist then? A. Well, not being a lawyer, I would not want to—I would find it difficult to answer that either way. Certainly I am not going to be critical of a State for exercising its police powers.

Q. And you do agree then that this is an area of legitimate police power operation?

Mr. Light: I object to that.

Mr. Lucente: I am going to object to that on the ground that he is asking for a conclusion of law. I don't believe the witness is qualified to answer your question, Mr. Lessenberry.

The Witness: I am not a lawyer.

Mr. Lessenberry: I think that perhaps his reputation and his experience would enable him to form an opinion as to the interest of the State in relation to safety and crew size.

Mr. Lucente: That is not the subject on which he is qualified. Nothing in his background really lends itself to that. I don't think that is a proper question.

By Mr. Lessenberry: Q. Let me approach it this way. I will ask you if you have an opinion in regard to Legislatures fixing minimum crew sizes for railroads? A. About all I can say in that respect and please understand I am not being facetious nor critical. My experience indicates to me that the laws such as those we are discussing are obsolete and impose a burden upon the railroad industry and the public interest that has long since become obsolete.

Q. All right, you would then, I take it from your testimony, the size of railroad crews in Arkansas and elsewhere in the Nation should be established by bargaining between railroad organizations and management? A. Certainly we have not objected to negotiating on that subject where labor has a legitimate interest. If that is not responsive and if you would repeat your question I would be happy to attempt to be, to give you a more direct answer.

Q. We will accept it. A. We had it in Oregon, we had it in Washington, California, various other States. I appeared in both Washington and Oregon. There their laws were repealed without any struggle. In Oregon it was by referendum, in California by referendum, Nevada by referendum, South Dakota by referendum. Wherever the matter has been submitted to the people, then I think they recognized that our position is supported in justice and on the basis of simply economics and we have prevailed.

Q. Of course, you didn't in Arkansas in 1958? A. That is true. In 1958 we did not. Conditions have changed a great deal since 1958.

Q. I believe that the position that the railroads take that in the event that in our instance the Arkansas Full Crew Laws were either repealed or declared unconstitutional, railroad management would exercise discretion as to when to place an additional helper or a fireman or an additional switchman on a particular train run or a particular switching operation depending upon unusual circumstances that might be evident such as weather or the type of train or the type of switching operations. Is this correct? A. Yes, sir.

Q. And railroad management would hesitate if it felt under those circumstances that an additional crewman to those established by collective bargaining would be necessary even for the safety of the crew or for the safety of the public? A. I believe, I firmly believe that to be true and there are other elements that enter into it. There is the question of efficiency of operations. Certainly no railroad management would want a crew under-manned if it meant delaying your trains or excessive overtime and things of that nature so there is a very definite control. It is a control that means so much to the railroad industry and the railroad industry must serve efficiently if they hope to retain the business in what is now a very highly competitive field of endeavor.

Q. Well, would safety of operations likewise affect the size of the crew over the minimum provided by your collective bargaining agreements? A. Absolutely. I think safety, sir, and efficiency go hand in hand. I think it is not efficient if it is unsafe.

Q. It would be conceivable at least that there might be crews that would operate in Arkansas comparable to those that are required by State statute at this time? A. I don't think so. In other words, I do not know of any through freight operation under modern railroad plans of operation that would justify three brakemen.

Q. Now, you restricted your response, of course, to through freight service as I understand your response and

I would like to ask if you have the same conclusion in highly industrialized areas where switching is carried on particularly where you are presented with the situation of heavily traveled highway grade crossings or the location of schools or parks or residential areas. You concede because of the curvature of the track and the number of the cars you are handling and all of these other matters that you might want those additional brakemen on that switch crew? A. No. I think that as a maximum a conductor and two brakemen as the maximum can take care of any situation that might present itself.

Q. Regardless of any other circumstances? A. That is correct. The railroad I was with for forty years did not have more than two brakemen on any road freight train or any yard locomotive or yard assignment and the safety record of this railroad has always been exceptionally high.

Q. Sir, do you know if any State official of the State of Arkansas participated in any hearings before any of these Arbitration Boards or awards that have been made? A. Oren Harris who is Chairman of the House Committee or on Commerce was very active in connection with the passage of public law 88-108, very active.

Q. I understand that but as far as the contribution of testimony on which the awards were based, do you know of any State elected official from Arkansas participating? A. No, nor any other State.

Q. They weren't invited, were they? A. Well, no, they were not either by the union, the carriers or the public members.

Q. Are you aware of different cost analyses that have been furnished by affidavits and exhibits to this lawsuit from different railroads? A. No, I am not.

Q. If I were to tell you that cost analyses had been prepared and submitted in this lawsuit and those cost analyses were computed as I understand it on the basis of the elimination of certain positions and that no variable or other factor was added to offset this in any way, would

you agree that those cost analyses correctly reflect the opinion of railroad management as to the actual expense of operating the railroad? A. Well, I am not in a position to make a comment in that area without having far more extensive background of what those exhibits purport to portray.

Q. Well, Mr. Wolfe, you said in your earlier response to my cross-examination that railroad management would be prone and indeed quite interested for railroad efficiency and safety to its employees and the public to add crewmen under certain circumstances? A. Yes.

Q. Did I understand that testimony to be correct? A. You did.

Q. Now, this wasn't considered by the people making the cost analyses and then the results of those cost analyses wouldn't be entirely correct, would they? A. I haven't the faintest idea because I have not seen those cost analyses and I do not know anything about them but I do know this that the Missouri Pacific is an Arkansas railroad and I know that under the Special Board Award that function pursuant to Award 282 that that railroad had permission to discontinue certain jobs which they did not discontinue.

Q. And your comment I take it then is that the officials of the Missouri Pacific Railroad were motivated in these instances because they felt like regardless of the conclusions of the Board, these positions were necessary either for public safety or employee safety or efficiency of the operations? A. I think all three things may have been involved. I am not certain that all three but at least one or more of them was.

* * * *

Redirect Examination,

By Mr. Lucente:

Q. Mr. Wolfe, with respect to the Missouri Pacific crews that you referred to, was the authority of the Special

Board related to reducing the crews to a foreman and one helper? A. Yes.

Q. And what was the size of the crew that the Missouri Pacific has maintained? A. A conductor and two helpers.

Q. You referred to your forty years experience with the Burlington. You worked as a switchman part of that time didn't you, Mr. Wolfe? A. Yes, I did, switchman, switch tender and yardmaster for a number of years.

Q. You were general yardmaster? A. Yes, sir, I was general yardmaster.

Q. Of what yards were you yardmaster? A. Well, I was yardmaster at Hannibal, Missouri, Keokuk, Iowa, yardmaster at Omaha, general yardmaster at Omaha, acting general yardmaster and acting general yardmaster at St. Louis, Missouri.

Q. Are the Burlington terminals at Omaha and St. Louis very substantial terminals? A. Yes, they are very substantial terminals.

Q. Where did you work as a switchman? A. At Hannibal, Missouri.

Q. With respect to that experience that you testified as I understand it the Burlington freight trains and its yard switching assignments were manned by a maximum of a conductor and two brakemen or two helpers? A. That is correct.

Mr. Ross: I object to that on the ground that it is a leading question and that it suggests the answer which Mr. Lucente is seeking.

Mr. Lucente: The answer can stand over the objection.

Q. Mr. Wolfe, you referred to the report of the Joint National Board as being the work of a majority of the members of the Board. Was one of the members that signed the report an official of the Brotherhood of Locomotive Engineers? A. Yes, sir, he is our first assistant grand chief engineer which means he is the second highest officer of that union.

Q. Since the time that this report was issued and was

signed by the first assistant grand chief engineer, has the Brotherhood of Locomotive Engineers held a convention at which officers were elected? A. Yes, sir.

Q. Can you tell me who the first assistant grand chief engineer of the Brotherhood——

Mr. Lessenberry: I will object to that unless he tells us how——

The Witness: I can tell you.

Mr. Lucente: Have you been advised of the result?

Mr. Lessenberry: The same objection.

By Mr. Lucente: Q. Are you aware of the results? A. Yes, sir.

Mr. Lessenberry: I make the same objection.

Mr. Lucente: Let's find out how he found out.

Mr. Ross: I would join in the objection of Mr. Lessenberry.

The Witness: It was in the Engineer's publication and also I learned about it through personal conversation with Mr. Heath, Grand Chief Engineer and Mr. C. J. Coughlin, First Assistant Grand Chief Engineer. They both told me personally.

Mr. Lessenberry: I further object that this is not the best evidence.

Mr. Ross: I join in the objection.

By Mr. Lucente: Q. Do you know how Mr. Coughlin was elected? A. He was elected by acclamation.

Mr. Lucente: That is all I have.

Recross-Examination,

By Mr. Ross:

Q. Mr. Wolfe, how many Special Boards, Special Board Awards have there been? A. As I remember, it's roughly one hundred.

Q. And how many Special Boards are referred to in your exhibit 80? To save time, Mr. Wolfe, let me ask you this—— A. I didn't count them but I know this in con-

nection with litigation in Washington, I know there were roughly one hundred of these Special Boards.

Mr. Ross: Would you accept Mr. Lucente's figure that there are twenty-three Board awards included in Exhibit 80?

The Witness: Yes, I would accept that.

Mr. Ross: No further questions.

By Mr. Lessenberry: Q. Mr. Wolfe, let me state first that I can't help but be impressed and have all sorts of admiration for you when I read your personal history but as I take it, you are not attempting to relate your experience on the Burlington road to the operation of railroads in the State of Arkansas, are you? A. No, my testimony and everything I do is based upon my general knowledge of railroad operations in this whole country of ours including Arkansas.

Q. Well, as a working railroad crewman, how many years ago, Mr. Wolfe? A. Well, I started with the Burlington on February 2, 1918.

Q. And you have remained in a crew working yard capacity for how long? A. Well, I retained my seniority as a switchman from February, 1924 until the latter part of 1929.

Q. Again I say you are not relating that experience and the operations of trains during that period of time and on that particular railroad to present day conditions in Arkansas? A. I do not limit the judgment, whatever it is, to my personal experience in train operation although it has been very helpful because we had almost every conceivable type of operation, mountain territory, desert territory, river grades, high congested yards, just about everything you would find on any railroad but my experience goes far beyond the Burlington Railroad.

Q. You never have operated on a railroad in the State of Arkansas? A. No, sir, but I am fairly familiar with your operations in Arkansas with the type of operations,

kind of locomotives you use, grades, curvature to a certain extent, speed of your trains and so forth.

Q. This information is not based on your personal observation? A. I've been to Arkansas on several occasions. I rode the trains but I would say that it is based more on my general knowledge of railroad operation in this country and I know of nothing that could be called peculiar to the State of Arkansas. In other words, I don't think there is any operation in Arkansas if you don't find something that is almost identical in other States. That's true in California and Oregon. In fact, those States have problems that you do not have in Arkansas to any great extent, snow blockades and things of that nature.

Q. I beg to differ with you there, Mr. Wolfe, I think we had a problem of snow and the stoppage of railroad traffic in Arkansas not longer than a couple of months ago? A. I mean by that it hardly compares with the Sierra Mountains in the Northwest where your drifts go up to fifty feet.

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PLAINTIFFS' EXHIBIT NO. 79—
Report of National Joint Board.

PLAINTIFFS' EXHIBIT NO. 80—
Awards of Special Boards of Adjustment.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 81—
Testimony of A. H. Lott.

INTERVENORS' REBUTTAL EXHIBIT NO. 61—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 82—
Answers to Intervenors' Interrogatories.

PLAINTIFFS' EXHIBIT NO. 83—
Answers to Intervenors' Interrogatories.

PLAINTIFFS' EXHIBIT NO. 84—
Answers to Intervenors' Interrogatories.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 85—
Testimony of M. L. Hall.

INTERVENORS' REBUTTAL EXHIBIT NO. 85—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 86—
Testimony of D. E. Farrar.

INTERVENORS' REBUTTAL EXHIBIT NO. 86—
Cross-Examination of H. K. Vollrath.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 87—
Answers to Intervenors' Interrogatories.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 88—
Testimony of Joseph Hyzny.

INTERVENORS' REBUTTAL EXHIBIT NO. 88—
Cross-Examination.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 89—
Answers to Intervenors' Interrogatories.

[Omitted from Appendix.]

PLAINTIFFS' EXHIBIT NO. 90—
Testimony of J. K. Beshears.

My name is J. K. Beshears and I am Vice President—Personnel of the St. Louis-San Francisco Railway Company (hereinafter referred to as "Frisco"). I have been continuously employed by the Frisco since I was employed as a brakeman in 1936. Subsequently, I worked as Conductor, Safety Supervisor, Trainmaster, Assistant Superintendent, both terminal and division Superintendent, Director of Labor Relations and in my present capacity. Since June 1, 1955, when I was appointed Director of Labor Relations, continuing through my appointment as Vice President—Personnel in 1957 to the present time I have been primarily responsible for the conduct of our relations with the various labor organizations which represent our employes. This includes such matters as the negotiation, interpretation and administration of the various labor agreements pertaining to rates of pay and working conditions.

The operations of the St. Louis-San Francisco Railway Company in freight, passenger and yard service extend over nine states, including the State of Arkansas. Exhibit 1 is a map of the Frisco indicating the territory through which it operates.

The Frisco was a party to the proceedings which resulted in the Report of the Presidential Railroad Commission, dated February 26, 1962, and the Award of Arbitration Board No. 282, dated November 26, 1963. On May 7, 1964, the Frisco placed in effect Section II of the Award of Arbitration Board No. 282, relating to the elimination of firemen from road freight and yard engines. Pursuant to this section of the Award, the

Frisco has eliminated a large number of fireman assignments in road freight and yard service in states other than Arkansas which do not have crew consist laws.

During June 1966 the Frisco operated 6550 road freight trips on its entire railroad of which 1733 had a fireman on the crew. Of these, there was a total of 788 trips operated in Arkansas of which 678 trips had a fireman on the crew. Thus approximately 12% of our total trips were in Arkansas but they accounted for approximately 39% of the trips we operated with a fireman that month.

During the same month the Frisco operated 5705 yard engine shifts or days on the entire railroad, of which 1322 had a fireman on the crew. Of these, there was a total of 126 that operated in Arkansas, all of which had a fireman on the crew. Thus, approximately 2.2% of our total yard crew days were worked in Arkansas but they accounted for approximately 9.5% of the yard shifts that we operated with a fireman that month.

With few exceptions, if any, where a fireman was used on these road freight and yard engines it was because of the requirements of the Arkansas Law, because the assignments had been designated by a BLF&E Local Chairman as a "veto" job or because attrition had not as yet reduced the supply of "protected" firemen to the needed level of employment.

In the seniority districts which wholly or partially involve Arkansas operations, the Frisco complied with the provisions of Section II of the Award of Arbitration Board No. 282 by listing 36 freight and 9 yard crews which in our judgment, do not require the service of a fireman helper. These lists, Exhibit 2, were served on the Local Chairmen of the Brotherhood of Locomotive Firemen and Enginemen. Subsequently, these Local Chairman designated the crews, pursuant to Part B (2) of Section II of the Award of Arbitration Board No. 282, on which firemen must be retained. These designations are reproduced as Exhibit 3 to my statement.

On the seniority district that extends from St. Louis, Missouri, southward through northeast Arkansas to Memphis, Tennessee, the BLF&E Local Chairmen had the opportunity to "veto" a road job on a list that included Missouri jobs and Arkansas jobs and chose to "veto" a Missouri job. Later, when given the same opportunity after obtaining another veto, this Local Chairman again made the same choice. The Arbitration Award, in regard to these designations, provided that—"Each local chairman . . . shall have the right, based upon considerations of safety, undue work burden, and adequate and safe transportation service to the public, to designate the engine crews in which the carrier shall be required to use firemen . . ." I can only assume that the specified criteria were the ones actually used by this Local Chairman in making the choice to veto Missouri jobs rather than Arkansas jobs. We have retained firemen on jobs within the State of Arkansas not designated by the Local Chairmen because of the provisions of the Arkansas statute regarding the use of firemen in freight and yard service.

The Frisco also utilized the provisions of Section III of the Award of Arbitration Board No. 282 relating to the consist of train crews in road and yard service. The procedures specified by Section III of the Award resulted in the establishment of a Special Board of Adjustment on the Frisco on which I sat as the Carrier representative. The Award rendered by this Special Board is reproduced as Exhibit 4 to this statement.

This Award describes in detail the events which led up to the proceedings before the Special Board. I shall, therefore, omit any discussion of those circumstances. There are certain other aspects of the Award, however, which I should like to call to the Court's attention.

This Special Board, with Mr. Arthur W. Sempliner as the neutral member and chairman, found that the proposal of the Carrier was justified, with some modifi-

cations, under the guidelines specified in the Award of Arbitration Board No. 282, including the safety guideline emphasized by the Board. Generally, the Frisco proposed that yard crews be reduced from a foreman and two or three helpers to a foreman alone at some yards and a foreman and one helper at other yards. With respect to yards located at Arkansas the Frisco proposed that the crews working at Fayetteville and Jonesboro consist of a minimum of a foreman and the crews at Fort Smith Yard be reduced to a foreman and one helper. The Award of the Special Board approved the proposed consist at the Frisco's Arkansas yards as well as the consist proposed at most of the other yards on the Frisco System.

The Frisco operated 5705 yard shifts or days on its entire railroad during June, 1966, 126 of which were in Arkansas. The Arkansas yard crews had three helpers on each shift or a total of 378 helper shifts for the month. Outside Arkansas we worked 7830 helpers on 5579 yard crews or an average of 1.4 helpers per crew shift. We have been able to work a yard crew at the smaller yards with only a foreman on only very rare occasions because we have had available "protected" men. Thus, for all practical purposes we can disregard the possibility of such an assignment. Consequently, in June, 1966, we had three helpers on each yard crew operated in Arkansas. In the other states, our yard crews had two helpers approximately 40% of the shifts worked and one helper on the remaining 60% of the crews. As attrition of "protected" men permits, the number of helpers will decrease until our normal crew consist will be of the size specified in the Special Board Award for the various yards.

In regard to road crew consist, the Frisco proposed that, generally, the crew consist be reduced on specified territories to either a conductor or a conductor and one brakeman or flagman. The Award of Arbitration Board

No. 282 specified that the standard crew consist of one conductor and two brakemen or flagmen could not be reduced in main line territory but left to the discretion of Special Boards the defining of "main line" on the individual railroads. The Special Board established on this railroad found our proposal, with some modifications, to be justified under the guidelines specified by the Arbitration Board. It also specified those portions of this railroad which it found to be "main line" for crew consist purposes and so far as Arkansas trackage is concerned, the Special Board ruled the lines from St. Louis through Arkansas to Memphis and from Kansas City through Arkansas to Memphis as main lines on which the freight crew consist should remain unchanged. This Special Board further ruled that, although all other trackage was "branch line" for this purpose, the Frisco should have a crew consist of conductor and two brakemen on the line Monett, Missouri, to Fort Smith, Arkansas (not including Bentonville, Arkansas branch); that it could have a conductor and one brakeman on the crews on the territories Marion, Arkansas to Hulbert, Arkansas and Hugo, Oklahoma to Hope, Arkansas; that it could have only a conductor on the territories, Ft. Smith, Arkansas to Paris, Texas (including the branch at Jenson, Arkansas); the wye-shaped trackage from Armorel and East Wilson, Arkansas through Wilson Junction to Leachville, Arkansas, and on the line that runs northward from Nettleton, Arkansas, through Leachville, Arkansas, on into Missouri. On the passenger trains operated on the line between Kansas City, Missouri, through Arkansas to Memphis, Tennessee, the Special Board specified that the crew could consist of only a conductor if the train consisted of three or less passenger-carrying cars.

As a consequence of this portion of the Special Board Award we have reduced our crew consist on the territories where the Award permits, to the extent that attri-

tion has permitted. In Arkansas, of course, the statute has prevented us from making these reductions and, in fact, we have had to hire additional men to maintain the three brakeman consist.

Thus, the situation on the Frisco with respect to the size of crews in freight and yard service is presently a result of the Award of Arbitration Board No. 282 insofar as freight and passenger trainmen and yard ground crews are concerned, except to the extent the Arkansas statutes are applicable. In the other states in which the Frisco operates, the size of the crews is governed by these Awards and the availability of "protected" men.

In addition to the requirement that firemen be used on certain freight trains and in yard service in Arkansas and that three helpers be used on certain switching crews in yard service, we are required to use three brakemen in freight service where the length of the train is in excess of 25 cars. As of June, 1966, the Frisco had a daily average of 26 crews in freight service on which we were using three brakemen as a result of the requirement of the Arkansas statutes.

At Hayti, Missouri, we maintain a so-called "third man extra board" so that a third brakeman can be added to the crews working between Chaffee, Missouri, through Arkansas to Memphis. This is done solely because of the Arkansas statutes. The crews on these runs normally work from Chaffee to Memphis, a distance of 174 miles. The third brakeman is added for only the 93 mile segment from Hayti to Memphis. At all other points we generally work the third brakeman from the crew terminals in Missouri and Oklahoma to the crew terminal in Arkansas.

These differences between the size of crews used in freight and yard service in Arkansas and in other states through which the Frisco operates are not justified by any significant differences in the kinds of freight and yard

operations conducted in the various states, or the physical and geographical circumstances under which the operations are conducted. With respect to physical characteristics, the relevant data as to grades, curves, and grade crossings shows that the Frisco route through Arkansas is not essentially dissimilar from the Frisco line in neighboring states.

With respect to density of traffic, freight operations over the Frisco lines in Arkansas are comparable to freight operations on other parts of the Frisco system. Attached as Exhibits 5 and 6 to this statement are charts showing traffic density on the Frisco by gross ton miles and net ton miles and which indicate the similarities between Arkansas and adjoining states.

So far as train lengths are concerned, the average Arkansas train in 1965 contained 72.5 cars while on the adjoining operating subdivisions it averaged 73 cars. Mr. Troth will discuss the similarities in the tracks, signaling systems and the radio equipment in use.

With respect to yard operations, the crews in Arkansas on which we are required to use three helpers perform service which is essentially similar in all major respects to the service performed by crews consisting of a foreman and one helper or a foreman and two helpers in states other than Arkansas.

The Special Board on this property, before awarding the reduction in crew consist, gave the safety issue careful consideration and in its Findings (page 3) said, "Special consideration was given to the safety of the men in their working conditions, and the modern and efficient equipment of the railroad." Thus, this Special Board confirmed my opinion that operations in yard service are as safe with a crew consisting of a foreman and one helper as they are with a crew consisting of a foreman and three helpers.

[Exhibits to Testimony Omitted from Appendix.]

INTERVENORS' REBUTTAL EXHIBIT NO. 90—

Cross-Examination,

By Mr. Ross:

Q. State your name and address, please, sir? A. J. K. Beshears, 3233 Trafficway, Springfield, Missouri.

Q. And you are Vice President in charge of personnel for the St. Louis-San Francisco Railway Company? A. Yes, sir.

Q. In this position are you in charge of the negotiations with the organizations pertaining to labor matters? A. Yes, sir, either myself directly or some one under my direction.

Q. And in these negotiations, of course, you are representing your railroad, St. Louis-San Francisco Railway Company? A. That's right.

Q. Mr. Beshears, you mentioned some reductions in the employment of firemen and the employment of brakemen in the Frisco system. Do you know whether or not the operations without firemen have had any effect on the accident expense on the St. Louis-San Francisco Railway Company? A. No, sir, I do not.

Q. You do not know? A. No, sir.

Q. Then, you have no information on which to base any opinion as to the safety of the operations without firemen? A. I would say I do not.

Q. Mr. Beshears, under Board of Arbitration Award 282, it was not necessary for the firemen's organization in Arkansas to veto any of the jobs in Arkansas, was it?

Mr. Light: I object to that question because it calls for a legal conclusion.

Mr. Ross: You may answer, Mr. Beshears.

The Witness: Could I ask a question there, please.

Mr. Light: If you know the answer, you may answer.

By Mr. Ross: Q. Under Arbitration Board Award 282, it was not necessary for the firemen's organization to veto any firemen's jobs in the State of Arkansas, was it?

Mr. Light: I object to the question on the grounds previously stated but if the witness knows the answer, he may answer for the record.

The Witness: I don't fully understand what you mean "necessary".

Mr. Ross: I will withdraw the question.

Q. Mr. Beshears, in your statement you indicate that Frisco Railway Company submitted a list of jobs including Arkansas jobs on which the Frisco wished to remove the fireman. It was not necessary for the fireman's organization to veto any of these jobs in order to retain them in Arkansas, was it? A. I would say no it was not necessary.

Q. Mr. Beshears, on page 11 at the bottom of the page and continuing on to page 12 you state that "There are no substantial differences in the operations of your railroad in Arkansas and in other States." With reference to the number of grade crossings on the Frisco Railroad in Arkansas, do you have figures as to the number of crossings located in Arkansas? A. I do not, no.

Q. Do you have figures on the percentages of the various grades, percentage of grade of track located in Arkansas? A. I do not have them myself. They are maintained in our offices of the railroad.

Q. Mr. Beshears, are you familiar with accident statistics for your railroad yard operation on the Frisco Railroad? A. No, sir.

Q. Mr. Beshears, the notices which you refer to in your statement, that is, the notices to the trainmen's organization concerning the number of brakemen which the Frisco proposes for the various runs on the Frisco property, did you help prepare those notices? A. Yes, sir.

Q. And helped determine the runs on which those notices would apply? A. Yes, I assisted with the assistance of the operating people.

Q. And then you participated on the special board? A.

Yes, sir, I was the carrier representative on the Special Board.

Q. I believe the organization representative appeared at the hearing of that Board under protest, did he not? A. The first two days, as I recall, he appeared under protest. After that he appeared—I don't recall whether it was under protest or not but he did not sign the award.

Q. Was it called to this Board's attention that any award rendered would not be applicable to jobs in the State of Arkansas? A. Not to this Board, no, sir.

Mr. Ross: No further questions.

Mr. Lessenberry: No questions.

Redirect Examination,

By Mr. Light:

Q. Mr. Beshears, you have been with the Frisco Railroad for about thirty-one years, is that correct? A. Yes.

Q. Where did you work as a brakeman for this railroad? A. On the Eastern Division which encompasses from St. Louis to Springfield, freight service from St Louis to Kansas City we had a high line Monette to St. Louis in passenger service and then I have made trips as a brakeman and as a conductor at other points on the railroad, for instance, from Springfield to Kansas City, Springfield to Memphis.

Q. The last run that you mentioned from Springfield to Memphis would be largely in Arkansas. Is that correct? A. Not from Springfield to Memphis, no, sir. I think you will find there was more territory in Missouri than there is in Arkansas. This would be a passenger run, if you worked from Springfield to Memphis. Thayer is the terminal for freight.

Q. That would be in part in Arkansas? A. Yes, sir.

Q. And where have you worked as a conductor for the Frisco? A. On the same territory.

Q. Where were you trainmaster? A. I was terminal

trainmaster at Birmingham, Alabama, assistant superintendent at Amory, Mississippi.

Q. And where did you serve as superintendent? A. Terminal superintendent at Birmingham, Alabama and division superintendent at Fort Smith, Arkansas on the Central Division, Division Superintendent at Chaffee, Missouri over the River Division.

Q. Is Arkansas in the River Division? A. Partially. Fort Smith, Arkansas is partially in Arkansas territory too.

Q. I am not as familiar with your railroad as I am some of the others. Has the territory that you have described in which you have worked from time to time, does that substantially cover your railroad or is there some part where you have not worked? A. There are parts on our railroad where I have not worked as an operating officer. However, I was safety supervisor and had the entire railroad.

Q. Did those duties require you to be over your entire railroad from time to time? A. Yes, sir.

Q. Do your present duties require—— A. Yes, sir, they do.

Q. That you be over the road from time to time? A. Yes, sir.

Q. Have you during your some thirty-one years with Frisco railroad become familiar with the physical and geographical characteristics of your railroad throughout the system? A. Yes, sir.

* * * *

PLAINTIFFS' EXHIBIT NO. 91—Photograph.

PLAINTIFFS' EXHIBIT NO. 92—Daily Report.

PLAINTIFFS' EXHIBIT NO. 93—Freight Train Consist Report.

PLAINTIFFS' EXHIBIT NO. 94—Train Switch List.

PLAINTIFFS' EXHIBIT NO. 95—Photograph.

PLAINTIFFS' EXHIBIT NO. 96—Photograph.

PLAINTIFFS' EXHIBIT NO. 97—Photograph.

PLAINTIFFS' EXHIBIT NO. 98—Legal Transcript.

PLAINTIFFS' EXHIBIT NO. 99—Legal Brief Excerpt.

PLAINTIFFS' EXHIBIT NO. 100—Photograph.

PLAINTIFFS' EXHIBIT NO. 101—Chart.

PLAINTIFFS' EXHIBIT NO. 102—Chart.

PLAINTIFFS' EXHIBIT NO. 103—Time Slip.

PLAINTIFFS' EXHIBIT NO. 104—Map.

PLAINTIFFS' EXHIBIT NO. 105—Film.

PLAINTIFFS' EXHIBIT NO. 106—Map.

PLAINTIFFS' EXHIBIT NO. 107—Time Slips.

PLAINTIFFS' EXHIBIT NO. 108—Film.

[Omitted From Appendix.]

PLAINTIFFS' EXHIBIT NO. 109—Tables.

[Table of Contents Omitted From Appendix.]

I. General Train Accident Data.

TRAIN ACCIDENTS AND CASUALTIES TO PERSONS IN TRAIN ACCIDENTS

United States Railroads

12 Months Ending August 31, 1962 to 1966, inclusive

12 months ending August 31	Train accidents		Total casualties in train accidents		Casualties to persons in train accidents other than grade crossing accidents		Percent of freight and yard operations without firemen 1/
	Number	Percent change over preceding period	Number	Percent change over preceding period	Number	Percent change over preceding period	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1962	4,324	-	1,584	-	1,213	-	-
1963	4,638	+ 7.3	1,469	- 7.3	1,173	- 3.3	-
1964	5,127	+10.5	1,373	- 6.5	1,046	-10.8	10.3
1965	5,743	+12.0	1,143	-16.8	834	-20.3	42.4
1966	6,523	+13.6	1,157	+ 1.2	789	- 5.4	52.8
1962 to 1966		+50.9		-27.0		-35.0	
1963 to 1966		+40.7		-21.2		-32.7	
1964 to 1966		+27.2		-15.7		-24.6	
ACCIDENT AND CASUALTY RATES PER MILLION LOCOMOTIVE AND MOTOR-TRAIN MILES							
1962	4.81	-	1.76	-	1.35	-	-
1963	5.19	+ 7.9	1.64	- 6.8	1.31	- 3.0	-
1964	5.62	+ 8.3	1.50	- 8.5	1.15	-12.2	10.3
1965	6.19	+10.1	1.23	-18.0	0.90	-21.7	42.4
1966	6.96	+12.4	1.23	0.0	0.84	- 6.7	52.8
1962 to 1966		+44.7		-30.1		-37.8	
1963 to 1966		+34.1		-25.0		-35.9	
1964 to 1966		+23.8		-18.0		-27.0	

1/ Class I Line-Haul Railroads

Source: ICC Statements M-400.

TRAIN ACCIDENTS PER BILLION GROSS TON-MILES 1/

United States Railroads

Period	Frequency rates a						Percent change over preceding year					Percent of freight and yard operations without firemen 2/		
	1961	1962	1963	1964	1965	1966	1962	1963	1964	1965	1966	1964	1965	1966
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1st quarter	2.68	3.00	3.06	2.92	3.63	3.63	+11.9	+ 2.0	- 4.6	+24.3	0.0	1.5	39.0	49.9
2nd quarter	2.41	2.42	2.49	2.88	2.89	3.28	+ 0.4	+ 2.9	+15.7	+ 0.3	+13.5	14.3	47.6	55.1
1st half	2.54	2.70	2.76	2.90	3.25	3.45	+ 6.3	+ 2.2	+ 5.1	+12.1	+ 6.2	8.0	43.4	52.5
3rd quarter	2.50	2.32	2.68	2.87	3.10		- 7.2	+15.5	+ 7.1	+ 8.0		34.0	52.1	
4th quarter	2.61	2.71	3.00	3.24	3.40		+ 3.8	+10.7	+ 8.0	+ 4.9		36.2	51.4	
Year	2.55	2.61	2.80	2.98	3.25		+ 2.4	+ 7.3	+ 6.4	+ 9.1		20.1	47.6	

1/ Accident data for all railroads; gross ton-mile data for Class I Line-Haul Railroads.

2/ Class I Line-Haul Railroads.

Source: ICC Statements M-300, M-400, and OS Reports.

COST STATISTICS - CLASS I LINE-HAUL RAILROADS

Item	By years						Percent increase over year 1961				
	1961	1962	1963	1964	1965	1966	1962	1963	1964	1965	1966
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Average straight time hourly rates of pay:											
Maintenance of Way	$ 2.279	$ 2.359	$ 2.389	$ 2.456	$ 2.581	$ 2.671	3.5	4.8	7.8	13.3	17.2
Maintenance of Equipment	2.569	2.648	2.676	2.723	2.860	2.955	3.1	4.2	6.0	11.3	15.0
Average cost of new units:											
Diesel units	$189,012	$199,090	$199,584	$222,846	n.a.	n.a.	5.8	5.6	17.9	n.a.	n.a.
General service box cars	10,715	11,469	14,625	13,083	n.a.	n.a.	7.0	36.5	22.1	n.a.	n.a.
Special service box cars	13,000	14,803	15,679	17,534	n.a.	n.a.	13.9	30.6	34.9	n.a.	n.a.
Caboose cars	16,191	17,787	19,588	17,759	n.a.	n.a.	9.9	21.0	9.7	n.a.	n.a.
All freight-train cars	11,392	11,793	14,111	14,085	n.a.	n.a.	3.5	23.9	23.6	n.a.	n.a.

n.a. Not available.

Source: ICC Statements M-300 and Statements of Railways.

TRAIN ACCIDENT RATES AND CASUALTY RATES TO TRAIN AND ENGINE SERVICE EMPLOYEES IN TRAIN AND TRAIN-SERVICE ACCIDENTS PER MILLION LOCOMOTIVE AND MOTOR TRAIN-MILES - BY CLASSES OF SERVICE

Item	Frequency rates			
	1961	1962	1963	1964
(1)	(2)	(3)	(4)	(5)
Train accident rates a				
Passenger service	1.59	1.62	1.54	1.80
Freight service	6.52	6.62	6.84	7.22
Yard service	5.08	5.75	5.55	6.13
All services	4.70	4.89	5.36	5.79
Casualty rates to train and engine service employees in train and train-service accidents b				
Passenger service	3.36	3.32	3.44	3.61
Freight service	9.24	8.47	9.04	8.90
Yard service	22.67	22.36	22.09	22.82
All services	11.26	10.82	11.10	11.30

a Rates by class of service computed by dividing accidents on all railroads by train-miles for Class I Line-Haul Railroads. Rates for all services computed by dividing accidents on all railroads by train-miles on all railroads.

b Class I Line-Haul Railroads.

Source: Interstate Commerce Commission Annual Accident Bulletins, Statements M-400, and Statistics of Railroads.

OPERATING STATISTICS - CLASS I LINE-HAUL RAILROADS

Item	By years					Percent increase over year 1961			
	1961	1962	1963	1964	1965	1962	1963	1964	1965
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Passenger train-miles (000)	198,497	193,211	189,360	183,557	172,344	- 2.7	- 4.6	- 7.5	-13.2
Passenger gross ton-miles (000,000) a	138,489	133,912	128,917	125,668	114,767	- 3.3	- 6.9	- 9.3	-17.1
Revenue passenger miles (000,000)	20,283	19,902	18,494	18,245	17,389	- 1.9	- 8.8	-10.1	-14.3
Freight train-miles (000)	386,332	393,257	399,897	414,930	420,962	1.8	3.5	7.4	9.0
Freight gross ton-miles (000,000) a	1,274,535	1,326,022	1,370,733	1,432,105	1,494,002	4.0	7.5	12.4	17.2
Freight net ton-miles (000,000)	577,398	607,217	635,986	670,682	709,321	5.2	10.1	16.2	22.8
Yard locomotive miles (000)	211,874	213,928	214,068	219,119	221,323	1.0	1.0	3.4	4.5
Total gross ton-miles (000,000) a	1,413,024	1,459,934	1,499,650	1,557,773	1,608,769	3.3	6.1	10.2	13.9
Total traffic units b	603,927	632,667	658,727	695,822	732,521	4.8	9.1	15.2	21.3

a Cars and contents.
b Twice revenue passenger-miles plus revenue freight ton-miles.

Source: Interstate Commerce Commission Statistics of Railways.

II. General Casualty Data.

CASUALTIES TO PERSONS OF ALL CLASSES

United States Railroads

1961 - 1966

Year	Casualties in train and train-service accidents		Casualties in non-train accidents		Total casualties		Percent of freight and yard operations without fire-men 1/
	Number	Percent change over preceding year	Number	Percent change over preceding year	Number	Percent change over preceding year	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1961	19,779	-	9,466	-	29,245	-	-
1962	19,711	0.4	9,275	- 2.0	28,986	- 0.9	-
1963	20,366	+ 3.3	9,231	- 0.5	29,597	+ 2.1	-
1964	20,689	+ 1.6	9,348	+ 1.3	30,037	+ 1.5	20.1
1965	19,768	- 4.5	8,420	- 9.9	28,188	- 6.2	47.6
1st 8 mos. 1966	13,002	- 0.2	5,333	- 4.9	18,335	- 1.6	53.7

1/ Class I Line-Haul Railroads.

Source: ICC Statements M-300 and M-400.

CASUALTIES TO EMPLOYEES ON DUTY

United States Railroads

1961 - 1966

Year	Casualties in train and train-service accidents		Casualties in non-train accidents		Total casualties		Percent of freight and yard operations without firemen 1/
	Number	Percent change over preceding year	Number	Percent change over preceding year	Number	Percent change over preceding year	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1961	11,492	-	8,327	-	19,819	-	
1962	11,368	- 1.1	7,973	- 4.3	19,341	- 2.4	-
1963	11,730	+ 3.2	7,862	- 1.4	19,592	+ 1.3	-
1964	12,120	+ 3.3	8,036	+ 2.2	20,156	+ 2.9	-
1965	11,662	- 3.8	7,154	-11.0	18,816	- 6.7	20.1
1st 8 mos. 1966	7,384	- 5.9	4,609	- 2.7	11,993	- 4.7	53.7

1/ Class I Line-Haul Railroads.

Source: ICC Statements M-300 and M-400.

CASUALTIES IN TRAIN AND TRAIN-SERVICE ACCIDENTS

All United States Railroads

12 months period ending Aug. 31	Persons of all classes	Employees on duty	Train and engine service employees on duty	Percent of freight and yard operations without firemen 1/
(1)	(2)	(3)	(4)	(5)
	Number of Casualties (including Fatalities)			
1962	20,124	11,643	10,464	-
1963	19,515	11,352	10,253	-
1964	20,806	12,111	10,891	10.3
1965	20,250	11,955	10,880	42.4
1966	19,744	11,202	10,229	52.8
	Number of Fatalities (included in Casualties)			
1962	2,064	127	78	-
1963	1,967	147	103	-
1964	2,376	119	78	10.3
1965	2,281	136	86	42.4
1966	2,465	118	89	52.8
	Percentage Change over Preceding 12 Months Period			
1963	- 3.0%	- 2.5%	- 2.0%	
1964	+ 6.6	+ 6.7	+ 6.2	
1965	- 2.7	- 1.3	- 0.1	
1966	- 2.5	- 6.3	- 6.0	
	Fatalities (included in Casualties)			
1963	- 4.7%	+15.7%	+32.1%	
1964	+20.8	-19.0	-24.3	
1965	- 4.0	+14.3	+10.3	
1966	+ 8.1	-13.2	+ 3.5	

1/ Class I Line-Haul Railroads

Source: ICC Statements M-300 and M-400

CASUALTY RATES PER MILLION LOCOMOTIVE AND MOTOR TRAIN-MILES IN TRAIN AND TRAIN-SERVICE ACCIDENTS

All United States Railroads

12 months period ending Aug. 31	Persons of all classes	Employees on duty	Train and engine service employees on duty	Percent of freight and yard operations without firemen 1/
(1)	(2)	(3)	(4)	(5)
		Casualties		
1962	22.38	12.95	11.64	-
1963	21.83	12.70	11.47	-
1964	22.79	13.27	11.93	10.3
1965	21.84	12.89	11.73	42.4
1966	21.07	11.95	10.92	52.8
		Fatalities (included in Casualties)		
1962	2.30	0.14	0.09	-
1963	2.20	0.16	0.12	-
1964	2.60	0.13	0.09	10.3
1965	2.46	0.15	0.09	42.4
1966	2.63	0.13	0.09	52.8
		Percentage Change over Preceding 12 Months Period		
		Casualties		
1963	- 2.5%	- 1.9%	- 1.5%	
1964	+ 4.4	+ 4.5	+ 4.0	
1965	- 4.2	- 2.9	- 1.7	
1966	- 3.5	- 7.3	- 6.9	
		Fatalities (included in Casualties)		
1963	- 4.3%	+14.3%	+33.3%	
1964	+18.2	-18.8	-25.0	
1965	- 5.4	+15.4	0.0	
1966	+ 6.9	-13.3	0.0	

1/ Class I Line-Haul Railroads.

Source: ICC Statements M-300 and M-400

CASUALTY RATES PER BILLION GROSS TON-MILES IN TRAIN OPERATION TO TRAIN AND ENGINE SERVICE EMPLOYEES 1/

United States Railroads

Period	Frequency rates 2/						Percent change over preceding year					Percent freight and yard operations without firemen 3/		
	1961	1962	1963	1964	1965	1966	1962	1963	1964	1965	1966	1964	1965	1966
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1st quarter	6.68	6.97	6.50	5.77	6.25	5.46	+ 4.3	- 6.8	-11.2	+ 8.3	-12.6	1.5	39.0	49.9
2nd quarter	5.84	5.61	5.41	5.96	5.31	5.06	- 3.9	- 3.6	+10.2	-10.9	- 4.7	14.3	47.6	55.1
1st half	6.24	6.28	5.93	5.87	5.75	5.26	+ 0.6	- 5.6	- 1.0	- 2.0	- 8.5	8.0	43.4	52.5
3rd quarter	6.59	5.68	6.42	6.51	6.01		-13.8	+13.0	+ 1.4	- 7.7		34.0	52.1	
4th quarter	6.51	6.10	6.38	6.32	5.47		- 6.3	+ 4.6	- 1.0	-13.4		36.2	51.4	
2nd half	6.55	5.89	6.40	6.41	5.74		-10.1	+ 8.7	+ 0.2	-10.5		35.1	51.1	
Year	6.40	6.07	6.16	6.14	5.75		- 5.2	+ 1.5	- 0.3	- 6.4		20.1	47.6	

1/ Reporting Divisions 111-118, inclusive.
2/ Accident data for all railroads; gross ton-mile data for Class I Line-Haul Railroads.
3/ Class I Line-Haul Railroads.

Source: ICC Statements M-300, M-400 and OS Reports.

III. Accident and Casualty Frequency Rates and Operations Without Firemen, 67 Class I Line-Haul Railroads.

TRAIN ACCIDENT RATES

(Per Million Locomotive and Motor Train-Miles)

67 Class I Line-Haul Railroads 1/

Item	35 Carriers*	32 Carriers#	67 Carriers
Percent of total locomotive and motor train-miles, 12 months ending June 1966	52.2	47.8	100.0
Percent of freight and yard service operated without firemen, 12 months ending June 1966	66.4	37.2	52.2
Train accident rates, 12 months ending June 30:			
1962	4.65	4.99	4.82
1963	4.75	5.28	5.01
1964	5.66	5.55	5.61
1965	5.98	6.41	6.19
1966	6.24	7.38	6.79
Increase in train accidents rates, 12 months ending June 30:			
1962 to 1963	+ 2.2%	+ 5.8%	+ 3.9%
1963 to 1964	+19.2	+ 5.1	+12.0
1964 to 1965	+ 5.7	+15.4	+10.3
1965 to 1966	+ 4.3	+15.1	+ 9.7
1962 to 1966	+34.2	+47.9	+40.9
1964 to 1966	+10.2	+33.0	+21.0

1/ Parties to Arbitration Award 282 representing 96.1% of the train-miles of all Class I Line-Haul Railroads for the 12 months ending June 1966.

* Carriers operating more than 52.2% of their freight and yard service without firemen.

\# Carriers operating less than 52.2% of their freight and yard service without firemen.

Source: ICC Statements M-400, ICC Operating Statistics, ICC Wage Statistics Forms B.

COLLISION RATES

(Per Million Locomotive and Motor Train-Miles)

67 Class I Line-Haul Railroads 1/

Item	35 Carriers*	32 Carriers#	67 Carriers
Percent of total locomotive and motor train-miles, 12 months ending June 1966	52.2	47.8	100.0
Percent of freight and yard service operated without firemen, 12 months ending June 1966	66.4	37.2	52.2
Collision rates, 12 months ending June 30:			
1962	1.21	1.14	1.17
1963	1.14	1.10	1.12
1964	1.40	1.12	1.26
1965	1.57	1.24	1.41
1966	1.65	1.47	1.57
Change in collision rates, 12 months ending June 30:			
1962 to 1963	- 5.8%	- 3.5%	- 4.3%
1963 to 1964	+22.8	+ 1.8	+12.5
1964 to 1965	+12.1	+10.7	+11.9
1965 to 1966	+ 5.1	+18.5	+11.3
1962 to 1966	+36.4	+28.9	+34.2
1964 to 1966	+17.9	+31.3	+24.6

1/ Parties to Arbitration Award 282 representing 96.1% of the train-miles of all Class I Line-Haul Railroads for the 12 months ending June 1966.

* Carriers operating more than 52.2% of their freight and yard service without firemen.

\# Carriers operating less than 52.2% of their freight and yard service without firemen.

Source: ICC Statements M-400, ICC Operating Statistics, ICC Wage Statistics Forms B.

CASUALTY RATES - TOTAL CASUALTIES IN TRAIN AND TRAIN-SERVICE ACCIDENTS

(Per Million Locomotive and Motor Train-Miles)

67 Class I Line-Haul Railroads 1/

Item	35 Carriers*	32 Carriers#	67 Carriers
Percent of total locomotive and motor train-miles, 12 months ending June 1966	52.2	47.8	100.0
Percent of freight and yard service operated without firemen, 12 months ending June 1966	66.4	37.2	52.2
Casualty rates, 12 months ending June 30:			
1962	21.51	20.66	21.09
1963	20.09	22.14	21.10
1964	22.01	21.79	21.90
1965	21.82	20.40	21.12
1966	20.97	19.82	20.43
Change in casualty rates, 12 months ending June 30:			
1962 to 1963	- 6.6%	+ 7.2%	+ *
1963 to 1964	+ 9.6	- 1.6	+ 3.8%
1964 to 1965	- 0.9	- 6.4	- 3.6
1965 to 1966	- 3.9	- 2.8	- 3.3
1962 to 1966	- 2.5	- 4.1	- 3.1
1964 to 1966	- 4.7	- 9.0	- 6.7

* Less than 0.05%

1/ Parties to Arbitration Award 282 representing 96.1% of the train-miles of all Class I Line-Haul Railroads for the 12 months ending June 1966.

* Carriers operating more than 52.2% of their freight and yard service without firemen.

\# Carriers operating less than 52.2% of their freight and yard service without firemen.

Source: ICC Statements M-400, ICC Operating Statistics, ICC Wage Statistics Forms B.

CASUALTY RATES - TOTAL CASUALTIES TO EMPLOYEES ON DUTY IN TRAIN AND TRAIN-SERVICE ACCIDENTS

(Per Million Locomotive and Motor Train-Miles)

67 Class-I Line-Haul Railroads 1/

Item	35 Carriers*	32 Carriers#	67 Carriers
Percent of total locomotive and motor train-miles, 12 months ending June 1966	52.2	47.8	100.0
Percent of freight and yard service operated without firemen, 12 months ending June 1966	66.4	37.2	52.2
Casualty rates, 12 months ending June 30:			
1962	11.58	12.47	12.02
1963	10.74	12.66	11.68
1964	11.71	12.89	12.29
1965	11.91	12.20	12.05
1966	11.03	11.32	11.17
Change in casualty rates, 12 mos. ending June 30:			
1962 to 1963	- 7.3	+ 1.5	- 2.8
1963 to 1964	+ 9.0	+ 1.8	+ 5.2
1964 to 1965	+ 1.7	- 5.4	- 2.0
1965 to 1966	- 7.4	- 7.2	- 7.3
1962 to 1966	- 4.8	- 9.2	- 7.1
1964 to 1966	- 5.8	-12.2	- 9.1

1/ Parties to Arbitration Award 282 representing 96.1% of the train-miles of all Class I Line-Haul Railroads for the 12 months ending June 1966.

* Carriers operating more than 52.2% of their freight and yard service without firemen.

\# Carriers operating less than 52.2% of their freight and yard service without firemen.

Source: ICC Statements M-400, ICC Operating Statistics, ICC Wage Statistics Forms B.

CASUALTY RATES - CASUALTIES IN HIGHWAY GRADE CROSSING ACCIDENTS

(Per Million Locomotive and Motor Train-Miles)

67 Class I Line-Haul Railroads 1/

Item	35 Carriers*	32 Carriers#	67 Carriers
Percent of total locomotive and motor train-miles, 12 months ending June 1966	52.2	47.8	100.0
Percent of freight and yard service operated without firemen, 12 months ending June 1966	66.4	37.2	52.2
Casualty rates, 12 months ending June 30:			
1962	5.23	4.39	4.81
1963	5.60	4.64	5.13
1964	6.34	5.14	5.75
1965	6.25	5.23	5.75
1966	6.53	5.44	6.01
Change in casualty rates, 12 months ending June 30:			
1962 to 1963	+ 7.1	+ 5.7	+ 6.7
1963 to 1964	+13.2	+10.8	+12.1
1964 to 1965	- 1.4	[illegible].8	0.0
1965 to 1966	+ 4.5	+ 4.0	+ 4.5
1962 to 1966	+24.9	+23.9	+24.9
1964 to 1966	+ 3.0	+ 5.8	+ 4.5

1/ Parties to Arbitration Award 282 representing 96.1% of the train-miles of all Class I Line-Haul Railroads for the 12 months ending June 1966.

* Carriers operating more than 52.2% of their freight and yard service without firemen.

\# Carriers operating less than 52.2% of their freight and yard service without firemen.

Source: ICC Statements M-400, ICC Operating Statistics, ICC Wage Statistics Forms B.

35 CLASS I LINE-HAUL RAILROADS PARTIES TO ARBITRATION AWARD 282 OPERATING MORE THAN 52.5% OF THEIR FREIGHT AND YARD SERVICE WITHOUT FIREMEN, 12 MONTHS ENDING JUNE 30, 1966

1. Atchison, Topeka & Santa Fe Railway Co.
2. Atlantic Coast Line Railroad Co.
3. Bessemer and Lake Erie Railroad Company
4. Central of Georgia Railroad Co.
5. Central Railroad of New Jersey

6. Chesapeake & Ohio Railway Company
7. Chicago & Eastern Illinois Railroad
8. Chicago, Burlington & Quincy Railroad Company
9. Chicago Great Western Railway Company
10. Chicago, Rock Island & Pacific Railroad Company

11. Clinchfield Railroad Co.
12. Colorado & Southern Railway
13. Denver & Rio Grande Western Railroad Company
14. Duluth, Winnipeg & Pacific Railroad Company
15. Ft. Worth & Denver Railroad Co.

16. Grand Trunk Western Railroad
17. Great Northern Railway Company
18. Gulf, Mobile & Ohio Railroad Co.
19. Illinois Central Railroad
20. Illinois Terminal Railroad Company

21. Kansas City Southern Railway
22. Louisville & Nashville Railroad Co.
23. Maine Central Railroad Company
24. New York, New Haven & Hartford Railroad Co.
25. Norfolk Southern Railroad Company

26. Northern Pacific Railway
27. Pennsylvania-Reading Seashore Lines
28. Richmond, Fredericksburg and Potomac Railroad
29. Seaboard Air Line Railroad
30. St. Louis-San Francisco Railway Co.

31. Southern Pacific Company
32. Spokane, Portland and Seattle Railway
33. Texas & Pacific Railroad
34. Western Maryland Rwy. of Alabama - Atlanta and West Point Rwy.
35. Western Pacific Railroad Co.

32 CLASS I LINE-HAUL RAILROADS PARTIES TO ARBITRATION AWARD 282 OPERATING LESS THAN 52.2% OF THEIR FREIGHT AND YARD SERVICE WITHOUT FIREMEN, 12 MONTHS ENDING JUNE 30, 1966

1. Akron, Canton & Youngstown Railroad Co.
2. Ann Arbor Railroad Co.
3. Baltimore & Ohio Railroad Co.
4. Boston & Maine Corp.
5. Canadian Pacific (Lines in Maine)
6. Central Vermont Railway, Inc.
7. Chicago & Illinois Midland Railway Co.
8. Chicago & North Western Railway Co.
9. Chicago, Milwaukee, St. Paul & Pacific Railroad
10. Delaware & Hudson Railroad Corporation
11. Detroit & Toledo Shore Line Railroad
12. Detroit, Toledo & Ironton Railroad
13. Duluth, Missabe & Iron Range Railroad
14. Elgin, Joliet & Eastern Railroad
15. Erie Lackawanna Railroad
16. Georgia Railroad
17. Lake Superior & Ishpeming Railroad Co.
18. Lehigh Valley Railroad Co.
19. Long Island Railroad
20. Louisiana & Arkansas Railway Co.
21. Missouri-Kansas-Texas Railroad
22. Missouri Pacific Railroad Co.
23. Monon Railroad
24. New York Central Railroad Co.
25. Norfolk & Western Railway Co.
26. Northwestern Pacific Railroad Co.
27. Pennsylvania Railroad
28. Pittsburgh & Lake Erie Railroad
29. Reading Company
30. St. Louis Southwestern Railway Lines
31. Soo Line Railroad Co.
32. Union Pacific Railroad

IV. Accident and Casualty Data—States With Minimum Crew Laws.

STATES WITH MINIMUM CREW LAWS

	Type of Service to Which Applicable				Comment
	Passenger	Freight	Switching	Other	
1. Arizona	X				
2. Arkansas	X	X	X		
3. California	X				
4. Indiana	X	X	X	X	
5. Maine	X				Applies only to passenger trains propelled by steam locomotives.
6. Massachusetts	X				Consist of freight, yard and light engine crews regulated by Department of Public Utilities.
7. Nebraska	X				
8. Nevada	X	X			Provisions requiring firemen apply only to steam locomotives.
9. New York	X	X	X	X	In 1966 legislature repealed law except for requirement that firemen be used on fuel-electric engines.
10. North Dakota	X				
11. Ohio	X	X	X		Except for pagr. provisions, law repealed in 1964 by referendum.
12. Oregon	X				In November 1964 general election, law was repealed except for provisions applicable to passenger service. Repeal becomes effective on January 1, 1967.
13. Texas	X	X		X	Applies only to steam locomotive operations.
14. Washington	X				Except for provisions applicable to passenger trains, law was repealed by passage of initiative measure in November 1966 general election.
15. Wisconsin	X	X	X	X	

STATES IN WHICH PUBLIC UTILITY COMMISSION EMPOWERED TO REGULATE CREW CONSIST

	Type of Service to Which Regulations Applicable				No regulations	Comment
	Passenger	Freight	Switching	Other		
1. Connecticut	X					
2. Massachusetts		X	X	X		Massachusetts statute applies to passenger service. Crew size in other types of service regulated by Department of Public Utilities.
3. Michigan				X		Michigan law requires flagman on light engine operated outside yard limits with requirement subject to waiver by Public Service Commission.
4. New Jersey					X	
5. Pennsylvania					X	
6. Rhode Island					X	
7. West Virginia					X	

STATES WITH NO MINIMUM CREW LAWS OR REGULATORY AUTHORITY

1. Alabama	8. Iowa	15. Missouri	22. South Dakota
2. Colorado	9. Kansas	16. Montana	23. Tennessee
3. Delaware	10. Kentucky	17. New Hampshire	24. Utah
4. Florida	11. Louisiana	18. New Mexico	25. Vermont
5. Georgia	12. Maryland	19. North Carolina	26. Virginia
6. Idaho	13. Minnesota	20. Oklahoma	27. Wyoming
7. Illinois	14. Mississippi	21. South Carolina	

Source: State laws and regulations as of January 1, 1967.

REPORT OF THE PRESIDENTIAL RAILROAD COMMISSION

III. Crew Consist Laws and Regulations

It is obvious, of course, that the ability of the Carriers, whether acting unilaterally or otherwise, to affect changes in crew consist will be limited by applicable State crew consist laws or regulations, so long as such laws and regulations continue to exist. As noted above, most of the legislation of this kind was enacted prior to 1920. These laws apparently fail to envision modern railroad operations. We feel that our recommendations with respect to this issue should have nationwide application. We recognize that there will be difficulty in applying the rule recommended by us in States where "full crew" laws have been enacted. How the restriction of these laws may be lifted, however, is a matter which goes beyond our charge.

RECENT LEGISLATIVE CHANGES IN MINIMUM CREW LAWS

North Dakota: In 1959 the legislature repealed that part of its law requiring a third brakeman on trains of 40 cars or more. In 1960 the Brotherhood of Railroad Trainmen sponsored a referendum on the repeal and the repeal was upheld by a large margin. Effective December 3, 1964 by popular referendum the remainder of the law was repealed except for the provisions applicable to passenger operations.

Nevada: Effective April 1, 1963 the legislature repealed that part of the state law requiring a flagman (third brakeman) on trains of over 50 cars.

Arizona: Effective December 3, 1964 by popular referendum the law was repealed except for provisions applicable to passenger operations.

California: Effective December 12, 1964 by popular referendum the law was repealed except for provisions applicable to passenger operations.

Mississippi: March 5, 1964 the legislature repealed the law in its entirety.

Nebraska: Effective November 17, 1965 the legislature repealed the law except as it applies to passenger operations.

Oregon: In 1965 the legislature repealed the law except for provisions applicable to passenger operations. The repeal became effective January 1, 1967.

New York: Effective June 27, 1966 crew size minima were repealed by the legislature except for provisions requiring firemen on locomotives.

Washington: An initiative measure to repeal the law, except for provisions applicable to passenger trains, was approved in the November 8, 1966 general election and became effective December 8, 1966.

TRAIN ACCIDENTS AND CASUALTIES IN TRAIN AND TRAIN-SERVICE ACCIDENTS

State of Arkansas and United States Total

12 mos. ending June 30	Train Accidents						Percent of train accidents in Arkansas to United States total	Percent of United States freight and yard operations without firemen 1/
	Number		Percent change over prior years		Indices: 12 months ending June 1962 = 100			
	Arkansas	United States	Arkansas	United States	Arkansas	United States		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1962	50	4,399	-	-	100.0	100.0	1.14	-
1963	49	4,475	- 2.0	+ 1.7	98.0	101.7	1.09	-
1964	53	5,042	+ 8.2	+12.7	106.0	114.6	1.05	4.7
1965	50	5,674	- 5.7	+12.5	100.0	129.0	0.88	39.2
1966	63	6,335	+26.0	+11.6	126.0	144.0	0.9[illegible]	52.1

12 mos. ending June 30	Casualties in Train and Train-Service Accidents						Percent of casualties in Arkansas to United States total	Percent of United States freight and yard operations without firemen 1/
	Number		Percent change over prior years		Indices: 12 months ending June 1962 = 100			
	Arkansas	United States	Arkansas	United States	Arkansas	United States		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1962	273	20,215	-	-	100.0	100.0	1.35	-
1963	248	19,443	- 9.2	- 3.8	90.8	96.2	1.28	-
1964	243	20,534	- 2.0	+ 5.6	89.0	101.6	1.18	4.7
1965	249	20,372	+ 2.5	- 0.8	91.2	100.8	1.22	39.2
1966	234	19,911	- 6.0	- 2.3	85.7	98.5	1.18	52.1

1/. Class I Line-Haul Railroads.

Source: ICC Statements M-300 and M-400.

TRAIN ACCIDENTS AND CASUALTIES IN TRAIN AND TRAIN-SERVICE ACCIDENTS

States Adjoining Arkansas and Arkansas

States	Number of train accidents, 12 months ending June 30					Percentage change in train accidents				
	1962	1963	1964	1965	1966	1962 to 1963	1963 to 1964	1964 to 1965	1965 to 1966	1962 to 1966
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Louisiana	58	62	78	75	90	+ 6.9	+25.8	- 3.8	+20.0	+55.2
Mississippi	31	47	45	54	76	+51.6	- 4.3	+20.0	+40.7	+145.2
Missouri	101	109	132	140	144	+ 7.9	+21.1	+ 6.1	+ 2.9	+42.6
Oklahoma	80	82	62	65	89	+ 2.5	-24.4	+ 4.8	+36.9	+11.3
Tennessee	108	111	176	200	208	+ 2.8	+58.6	+13.6	+ 4.0	+92.6
Texas	308	251	284	258	342	-18.5	+13.1	- 9.2	+32.6	+11.0
Total - 6 adjoining states	686	662	777	792	949	- 3.5	+17.4	+ 1.9	+19.8	+38.3
Arkansas	50	49	53	50	63	- 2.0	+ 8.2	- 5.7	+26.0	+26.0

States	Number of casualties in train and train-service accidents, 12 months ending June 30					Percentage change in casualties				
	1962	1963	1964	1965	1966	1962 to 1963	1963 to 1964	1964 to 1965	1965 to 1966	1962 to 1966
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Louisiana	315	310	299	280	314	- 1.6	- 3.5	- 6.4	+12.1	- 0.3
Mississippi	195	193	231	229	227	- 1.0	+19.7	- 0.9	- 0.9	+16.4
Missouri	621	663	679	685	621	+ 6.8	+ 2.4	+ 0.9	- 9.4	0.0
Oklahoma	287	298	256	258	265	+ 3.8	-14.1	+ 0.8	+ 2.7	- 7.7
Tennessee	295	288	355	327	327	- 2.4	+23.3	- 7.9	0.0	+10.8
Texas	1,293	1,125	1,216	1,123	1,181	-13.0	+ 8.1	- 7.6	+ 5.2	- 8.7
Total - 6 adjoining states	3,006	2,877	3,036	2,902	2,935	- 4.3	+ 5.5	- 4.4	+ 1.1	- 2.4
Arkansas	273	248	243	249	234	- 9.2	- 2.0	+ 2.5	- 6.0	-14.3

Source: ICC Annual Statements M-400.

TRAIN ACCIDENTS AND CASUALTIES IN TRAIN AND TRAIN-SERVICE ACCIDENTS

States with Laws Requiring Firemen on Diesel Locomotives and United States Total

States with laws requiring firemen on diesel locomotives	Number of train accidents, 12 months ending June 30					Percent change in train accidents				
	1962	1963	1964	1965	1966	1962 to 1963	1963 to 1964	1964 to 1965	1965 to 1966	1962 to 1966
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Arkansas	50	49	53	50	63	- 2.0	+ 8.2	- 5.7	+26.0	+26.0
Indiana	176	168	176	232	238	- 4.5	+ 4.8	+31.8	+ 2.6	+35.2
New York	245	199	218	224	214	-18.8	+ 9.5	+ 2.8	- 4.5	-12.7
Ohio	226	249	271	389	415	+10.2	+ 8.8	+43.5	+ 6.7	+83.6
Oregon *	53	50	53	64	65	- 5.7	+ 6.0	+20.8	+ 1.6	+22.6
Washington *	74	52	84	78	99	-29.7	+61.5	- 7.1	+26.9	+33.8
Wisconsin	80	90	73	128	125	+12.5	-18.9	+75.3	- 2.3	+56.3
Total - 5 states#	777	755	791	1,023	1,055	- 2.8	+ 4.8	+29.3	+ 3.1	+35.8
Total - 7 states	904	857	928	1,165	1,219	- 5.2	+ 8.3	+25.5	+ 4.6	+34.8
All other states	3,495	3,618	4,114	4,509	5,116	+ 3.5	+13.7	+ 9.6	+13.5	+46.4
Total - United States	4,399	4,475	5,042	5,674	6,335	+ 1.7	+12.7	+12.5	+11.6	+44.0

States with laws requiring firemen on diesel locomotives	Number of casualties in train and train-service accidents					Percent change in casualties				
	1962	1963	1964	1965	1966	1962 to 1963	1963 to 1964	1964 to 1965	1965 to 1966	1962 to 1966
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Arkansas	273	248	243	249	234	- 9.2	- 2.0	+ 2.5	- 6.0	-14.3
Indiana	650	660	715	693	650	+ 1.5	+ 8.3	- 3.1	- 6.2	0.0
New York	1,571	1,550	1,436	1,291	1,263	- 1.3	- 7.4	-10.1	- 2.2	-19.6
Ohio	1,154	1,175	1,245	1,270	1,237	+ 1.8	+ 6.0	+ 2.0	- 2.6	+ 7.2
Oregon *	191	186	206	246	255	- 2.6	+10.8	+19.4	+ 3.7	+33.5
Washington *	282	288	278	399	359	+ 2.1	- 3.5	+43.5	-10.0	+27.3
Wisconsin	385	493	451	504	459	+28.1	- 8.5	+11.8	- 8.9	+19.2
Total - 5 states#	4,033	4,126	4,090	4,007	3,843	+ 2.3	- 0.9	- 2.0	- 4.1	- 4.7
Total - 7 states	4,506	4,600	4,574	4,652	4,457	+ 2.1	- 0.6	+ 1.7	- 4.2	- 1.1
All other states	15,709	14,843	15,960	15,720	15,454	- 5.5	+ 7.5	- 1.5	- 1.7	- 1.6
Total - United States	20,215	19,443	20,534	20,372	19,911	- 3.8	+ 5.6	- 0.8	- 2.3	- 1.5

* Law not applicable to yard service.
\# Excluding Oregon and Washington, where law not applicable to yard service.

Source: ICC Annual Accident Bulletins and Statements M-400.

V. Historical Trends—Accident and Casualty Data.

"The business of plaintiff is still very hazardous. In two representative months of 1928 and 1929, there were a number of accidents (on the system) causing person or property damage from rear and head collisions, switching collisions, derailments, train parting, car breakdowns, rough coupling, draw bar breaks or pull-outs, while bleeding air from cars, adjusting couplers, making switch cut, adjusting coupler knuckles, pulling coupler pins, making couplings, setting brakes, throwing switches, sudden stopping, rerailing, carrying coupler knuckle, releasing hand brake, lining switches, and at crossings. In 1928 (the system), there were 308 collisions and 494 derailments. In that year 45 employees were killed and 1,189 injured in service. There were a number of crossing accidents." (**Missouri Pacific Railroad Company v. Norwood**, 13 F. Supp. 24, 35).

Train Accidents and Casualties to Employees on Duty in Train and Train-Service Accidents

MISSOURI PACIFIC SYSTEM (INCLUDING TEXAS AND PACIFIC)

Selected Historical Comparisons

Period	Train Accidents						Casualties to employees on duty in train and train-service accidents						Locomotive & motor train-miles (thousands)
	Collisions		Derailments		Total train accidents		Killed		Injured		Total		
	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	No.	Rate*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1925	186	3.24	603	10.51	868	15.13	51	.89	1,584	27.61	1,635	28.50	57,378
1926	178	3.03	495	8.43	763	13.00	42	.72	1,395	23.76	1,437	24.48	58,712
1927	189	3.25	515	8.85	814	13.99	41	.70	1,343	23.08	1,384	23.79	58,186
1928	308	4.93	494	7.90	1,045	16.71	45	.72	1,189	19.02	1,234	19.74	62,527
1929	242	3.80	522	8.20	977	15.34	25	.39	1,068	16.77	1,093	17.16	63,681
1956	85	2.19	190	4.90	325	8.37	9	.23	313	8.06	322	8.30	38,814
1961	49	1.52	95	2.94	166	5.13	5	.15	403	12.47	408	12.62	32,329
1962	53	1.68	90	2.85	159	5.03	6	.19	382	12.08	388	12.27	31,632
1963	35	1.08	94	2.89	141	4.34	1	.03	299	9.21	300	9.24	32,470
1964	33	.99	94	2.82	141	4.22	4	.12	259	7.76	263	7.88	33,390
1965	32	1.00	102	3.19	145	4.53	7	.22	275	8.59	282	8.81	32,015

* Frequency rate per million locomotive and motor train-miles.

Source: ICC Accident Bulletins and Statements M-400.

TRAIN AND TRAIN-SERVICE ACCIDENTS, CASUALTIES IN TRAIN AND TRAIN-SERVICE ACCIDENTS AND TRAFFIC LEVELS

All United States Railroads

Years 1925-1965

Period	Fatalities		Total casualties		Train accidents	Train and train-service accidents	Gross ton-miles (billions) a	Train-miles (millions) b
	Employees on duty	All persons	Employees on duty	All persons				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1925	1,228	6,364	33,473	54,357	20,785	67,539	1,511	1,698
1926	1,292	6,689	35,218	56,338	21,077	69,581	1,608	1,833
1927	1,166	6,382	29,092	48,985	18,975	61,302	1,593	1,777
1928	962	6,144	24,553	43,531	16,949	53,925	1,611	1,746
1929	1,069	6,132	23,039	42,831	17,185	53,127	1,662	1,778
1930	712	5,171	14,245	30,733	12,313	38,367	1,495	1,591
1931	488	4,853	9,921	24,910	8,052	29,214	1,276	1,361
1932	430	4,524	7,617	21,681	5,770	24,287	1,025	1,131
1933	395	4,816	6,778	21,288	5,623	23,379	1,033	1,107
1934	408	4,652	7,100	21,098	6,023	23,792	1,107	1,156
1935	434	4,889	7,090	21,480	6,551	24,480	1,141	1,183
1936	547	5,174	9,393	24,766	8,286	28,427	1,314	1,321
1937	516	5,118	9,661	25,267	8,412	29,013	1,380	1,369
1938	355	4,289	6,715	19,791	5,682	21,820	1,190	1,178
1939	376	4,156	7,247	20,166	6,074	22,417	1,301	1,241
1940	434	4,444	8,278	22,002	7,106	24,568	1,406	1,309
1941	614	4,883	11,636	26,314	9,401	30,431	1,671	1,492
1942	791	5,003	16,972	31,830	13,380	39,327	2,057	1,706
1943	804	4,682	22,480	38,250	16,061	47,055	2,263	1,811
1944	803	4,528	24,561	39,627	16,258	49,162	2,317	1,819
1945	736	4,465	25,031	40,234	16,892	50,463	2,189	1,754
1946	541	4,167	19,669	34,453	15,556	43,984	1,961	1,609
1947	547	3,944	19,082	33,089	16,816	44,439	2,041	1,627
1948	434	3,572	16,380	29,270	11,893	36,679	1,995	1,569
1949	321	3,163	11,949	22,766	8,597	27,812	1,751	1,374
1950	271	3,257	12,487	25,026	10,211	30,241	1,855	1,389
1951	311	3,207	13,875	25,814	11,077	31,997	1,952	1,410
1952	278	2,793	11,951	22,009	10,085	28,724	1,902	1,333
1953	232	2,805	10,931	21,338	8,976	26,618	1,873	1,308
1954	159	2,363	9,338	18,656	7,497	23,084	1,727	1,184
1955	203	2,575	10,595	20,614	8,716	25,833	1,862	1,226
1956	194	2,403	11,108	21,174	9,447	26,652	1,891	1,225
1957	159	2,365	8,519	17,206	4,106	18,475	1,815	1,160
1958	151	2,277	7,680	16,137	3,662	16,995	1,644	1,027
1959	118	2,041	8,158	16,042	4,047	17,698	1,688	1,027
1960	146	2,198	7,705	15,922	4,016	17,199	1,669	995
1961	102	2,067	11,492	19,779	4,149	19,792	1,629	883
1962	138	2,037	11,368	19,711	4,378	20,842	1,680	895
1963	126	2,077	11,730	20,366	4,822	21,692	1,721	900
1964	136	2,344	12,120	20,689	5,317	22,875	1,784	918
1965	131	2,327	11,662	19,768	5,967	22,831	1,836	930

NOTE: Data for years 1957-1960 inclusive, and for years 1961-1965 inclusive, are not strictly comparable to each other or to prior years because of ICC reporting rules changes.

a Total transportation service gross ton miles (locomotives, cars and contents) Class I Line-Haul Railroads.
b Locomotive-miles and motor train-miles, years 1925-1960; locomotive and motor train-miles, years 1961-1965; all United States railroads.

Source: ICC Annual Accident Bulletins, Statements M-400, and Transport Statistics.

TRAIN AND TRAIN-SERVICE ACCIDENTS AND CASUALTIES IN TRAIN AND TRAIN-SERVICE ACCIDENTS PER MILLION TRAIN-MILES

All United States Railroads

Years 1925-1965

	Fatalities		Total casualties			
Period	Employees on duty	All persons	Employees on duty	All persons	Train accidents	Train and train-service accidents
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1925	.72	3.75	19.71	32.01	12.24	39.78
1926	.70	3.65	19.21	30.74	11.50	37.96
1927	.66	3.59	16.37	27.57	10.68	34.50
1928	.55	3.52	14.06	24.93	9.71	30.88
1929	.60	3.45	12.96	24.09	9.67	29.88
1930	.45	3.25	8.95	19.32	7.74	24.12
1931	.36	3.57	7.29	18.30	5.92	21.47
1932	.38	4.00	6.73	19.17	5.10	21.47
1933	.36	4.35	6.12	19.23	5.08	21.12
1934	.35	4.02	6.14	18.25	5.21	20.58
1935	.37	4.13	5.99	18.16	5.54	20.69
1936	.41	3.92	7.11	18.75	6.27	21.52
1937	.38	3.74	7.06	18.46	6.14	21.19
1938	.30	3.64	5.70	16.80	4.82	18.52
1939	.30	3.35	5.84	16.25	4.89	18.06
1940	.33	3.39	6.32	16.81	5.43	18.77
1941	.41	3.27	7.80	17.64	6.30	20.40
1942	.46	2.93	9.95	18.66	7.84	23.05
1943	.44	2.59	12.41	21.12	8.87	25.98
1944	.44	2.49	13.50	21.79	8.94	27.03
1945	.42	2.55	14.27	22.94	9.63	28.77
1946	.34	2.59	12.22	21.41	9.67	27.34
1947	.34	2.42	11.73	20.34	10.34	27.31
1948	.28	2.28	10.44	18.66	7.58	23.38
1949	.23	2.30	8.70	16.57	6.26	20.24
1950	.20	2.34	8.99	18.02	7.35	21.77
1951	.22	2.27	9.84	18.31	7.86	22.69
1952	.21	2.10	8.97	16.51	7.57	21.55
1953	.18	2.14	8.36	16.31	6.86	20.35
1954	.13	2.00	7.89	15.76	6.33	19.50
1955	.17	2.10	8.64	16.81	7.11	21.07
1956	.16	1.96	9.07	17.28	7.71	21.76
1957	.14	2.04	7.34	14.83	3.54	15.93
1958	.15	2.22	7.48	15.71	3.57	16.55
1959	.11	1.99	7.94	15.62	3.94	17.23
1960	.15	2.21	7.74	16.00	4.04	17.29
1961	.12	2.34	13.01	22.40	4.70	22.41
1962	.15	2.28	12.70	22.02	4.89	23.29
1963	.14	2.31	13.03	22.63	5.36	24.10
1964	.15	2.55	13.20	22.54	5.79	24.92
1965	.14	2.50	12.53	21.25	6.41	24.54

NOTE: Data for years 1957-1960 inclusive, and for years 1961-1965 inclusive, are not strictly comparable to each other or to prior years because of ICC reporting rules changes.

Source: Calculated from preceding table.

VI. Accident and Casualty Data— Major Arkansas Railroads.

MILEAGE OPERATED BY STATES - 5 MAJOR ARKANSAS RAILROADS

(As of December 31, 1965)

State	C.R.I.&P.	K.C.S.	Mo.Pac.	St.L.S.F.	SSW	Total	5 roads percentage distribution by states
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Alabama				346		346	1.45
Arkansas	598	162	1,647	494	570	3,471	14.52
Colorado	258		155			413	1.73
Florida				47		47	.20
Illinois	301		277		121	699	2.92
Iowa	2,051					2,051	8.58
Kansas	1,120	37	1,950	594		3,701	15.49
Louisiana	188	245	1,020		39	1,492	6.24
Minnesota	288					288	1.21
Mississippi			3	180		183	.77
Missouri	510	202	1,381	1,347	219	3,659	15.31
Nebraska	238		329			567	2.37
New Mexico	153					153	.64
Oklahoma	1,053	149	162	1,396		2,760	11.55
So. Dakota	59					59	.25
Tennessee	1		5	18	1	25	.10
Texas	974	99	2,150	143	618	3,984	16.67
Totals	7,792	894	9,079	4,565	1,568	23,898	100.00

Source: Reports of carriers' to Interstate Commerce Commission.

TRAIN ACCIDENTS AND CASUALTIES IN TRAIN AND TRAIN-SERVICE ACCIDENTS,
5 MAJOR ARKANSAS RAILROADS 1/
ARKANSAS AND THE OTHER STATES IN WHICH THE 5 ROADS OPERATE

Years 1961 - 1966

Item	Number of accidents and casualties			Percent of total	
	Arkansas	Other states	Total	Arkansas	Other states
(1)	(2)	(3)	(4)	(5)	(6)
Train accidents:					
1961	43	247	290	14.83	85.17
1962	50	273	323	15.48	84.52
1963	49	273	322	15.22	84.78
1964	42	287	329	12.77	87.23
1965	54	299	353	15.30	84.70
1966	68	340	408	16.67	83.33
Total casualties in train and train-service accidents:					
1961	227	1,353	1,580	14.37	85.63
1962	240	1,255	1,495	16.05	83.95
1963	224	1,165	1,389	16.13	83.87
1964	242	1,268	1,510	16.03	83.97
1965	216	1,211	1,427	15.14	84.86
1966	215	1,230	1,445	14.88	85.12
Casualties to employees in train and train-service accidents:					
1961	97	666	763	12.71	87.29
1962	105	625	730	14.38	85.62
1963	105	598	703	14.94	85.06
1964	123	545	668	18.41	81.59
1965	93	602	695	13.38	86.62
1966	102	600	702	14.53	85.47
Total fatalities in train and train-service accidents:					
1961	41	203	244	16.80	83.20
1962	55	167	222	24.77	75.23
1963	39	177	216	18.06	81.94
1964	54	193	247	21.86	78.14
1965	52	161	213	24.41	75.59
1966	37	184	221	16.74	83.26
Fatalities to employees in train and train-service accidents:					
1961	2	4	6	33.33	66.67
1962	0	6	6	-	100.00
1963	0	12	12	-	100.00
1964	2	8	10	20.00	80.00
1965	2	8	10	20.00	80.00
1966	2	6	8	25.00	75.00

1/ C.R.I.&P., K.C.S., MoPac., St.L.S.F. and S.S.W. - these 5 roads operate 97.7% of the Class I Line-Haul mileage, and 88.7% of all railroad mileage, in the State of Arkansas.

Source: Summaries furnished by reporting railroads based on examination of data contained on Forms T covering train and train-service accidents reported to the Interstate Commerce Commission.

TRAIN ACCIDENT AND CASUALTY FREQUENCY RATES - 5 MAJOR ARKANSAS RAILROADS 1/
TRAIN AND TRAIN-SERVICE ACCIDENTS OCCURRING IN ARKANSAS AND IN OTHER STATES IN WHICH THE 5 ROADS OPERATE
Years 1961 - 1966

Item	Frequency rates per million locomotive and motor train-miles			Frequency rates per 100 million car miles			Frequency rates per billion gross ton-miles		
	Arkansas	Other states	Total	Arkansas	Other states	Total	Arkansas	Other states	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Train Accidents									
1961	3.90	4.27	4.21	8.18	11.66	10.97	1.54	2.19	2.06
1962	4.52	4.74	4.70	8.84	13.46	12.46	1.62	2.45	2.27
1963	4.33	4.69	4.63	8.32	12.56	11.65	1.53	2.37	2.18
1964	3.57	4.78	4.58	6.88	12.82	11.55	1.23	2.40	2.14
1965	4.66	4.91	4.87	8.95	13.46	12.49	1.58	2.43	2.24
1966	5.66	5.42	5.46	10.94	14.56	13.80	1.90	2.59	2.44
Percentage change									
1961 to 1962	+15.9	+11.0	+11.6	+ 8.1	+15.4	+13.6	+ 5.2	+11.9	+10.2
1962 to 1963	- 4.2	- 1.1	- 1.5	- 5.9	- 6.7	- 6.5	- 5.6	- 3.3	- 4.0
1963 to 1964	-17.6	+ 1.9	- 1.1	-17.3	+ 2.1	- 0.9	-19.6	+ 1.3	- 1.8
1964 to 1965	+30.5	+ 2.7	+ 6.3	+30.1	+ 5.0	+ 8.1	+28.5	+ 1.3	+ 4.7
1965 to 1966	+21.5	+10.4	+12.1	+22.2	+ 8.2	+10.5	+20.3	+ 6.6	+ 8.9
1961 to 1966	+45.1	+26.9	+29.7	+33.7	+24.9	+25.8	+23.4	+18.3	+18.4
1963 to 1966	+30.7	+15.6	+17.9	+31.5	+15.9	+18.5	+24.2	+ 9.3	+11.9
Total Casualties in Train and Train-Service Accidents									
1961	20.59	23.38	22.94	43.19	63.86	59.75	8.12	12.01	11.24
1962	21.70	21.77	21.76	42.43	61.89	57.65	7.77	11.24	10.49
1963	19.81	20.00	19.97	38.04	53.58	50.27	7.00	10.10	9.42
1964	20.56	21.12	21.03	39.63	56.64	52.99	7.09	10.62	9.84
1965	18.64	19.88	19.68	35.78	54.50	50.50	6.30	9.82	9.06
1966	17.89	19.61	19.33	34.60	52.67	48.87	6.00	9.37	8.65
Percentage change									
1961 to 1962	+ 5.4	- 6.9	- 5.1	- 1.8	- 3.1	- 3.5	- 4.3	- 6.4	- 6.7
1962 to 1963	- 8.7	- 8.1	- 8.2	-10.3	-13.4	-12.8	- 9.9	-10.1	-10.2
1963 to 1964	+ 3.8	+ 5.6	+ 5.3	+ 4.2	+ 5.7	+ 5.4	+ 1.3	+ 5.1	+ 4.5
1964 to 1965	- 9.3	- 5.9	- 6.4	- 9.7	- 3.8	- 4.7	-11.1	- 7.5	- 7.9
1965 to 1966	- 4.0	- 1.4	- 1.8	- 3.3	- 3.5	- 3.2	- 4.8	- 4.6	- 4.5
1961 to 1966	-13.1	-16.1	-15.7	-19.9	-17.5	-18.2	-26.1	-22.0	-23.0
1963 to 1966	- 9.7	- 2.0	- 3.2	- 9.0	- 1.7	- 2.8	-14.3	- 7.2	- 8.2
Casualties to Employees in Train and Train-Service Accidents									
1961	8.80	11.51	11.08	18.46	31.43	28.85	3.47	5.91	5.43
1962	9.49	10.84	10.62	18.56	30.82	28.15	3.40	5.60	5.12
1963	9.28	10.27	10.11	17.83	27.50	25.44	3.28	5.18	4.77
1964	10.45	9.08	9.30	20.14	24.34	23.44	3.61	4.56	4.35
1965	8.03	9.88	9.59	15.41	27.09	24.60	2.71	4.88	4.41
1966	8.49	9.57	9.39	16.41	25.69	23.74	2.85	4.57	4.20
Percentage change									
1961 to 1962	+ 7.8	- 5.8	- 4.2	+ 0.5	- 1.9	- 2.4	- 2.0	- 5.2	- 5.7
1962 to 1963	- 2.2	- 5.3	- 4.8	- 3.9	-10.8	- 9.6	- 3.5	- 7.5	- 6.8
1963 to 1964	+12.6	-11.6	- 8.0	+13.0	-11.5	- 7.9	+10.1	-12.0	- 8.8
1964 to 1965	-23.2	+ 8.8	+ 3.1	-23.5	+11.3	+ 4.9	-24.9	+ 7.0	+ 1.4
1965 to 1966	+ 5.7	- 3.1	- 2.1	+ 6.5	- 5.2	- 3.5	+ 5.2	- 6.4	- 4.8
1961 to 1966	- 3.5	-16.9	-15.3	-11.1	-18.3	-17.7	-17.9	-22.7	-22.7
1963 to 1966	- 8.5	- 6.8	- 7.1	- 8.0	- 6.6	- 6.7	-13.1	-11.8	-11.9

1/ C.R.I.&P., K.C.S., MoPac., St.L.S.F. and S.S.W. - these 5 roads operate 9.77% of the Class I Line-Haul mileage, and 88.7% of all railroad mileage, in the State of Arkansas

Source: Summaries furnished by reporting railroads based on examination of data contained on Form T covering train and train-service accidents reported to the Interstate Commerce Commission.

[Appendix to Exhibit Omitted From Appendix.]

PLAINTIFFS' EXHIBIT NO. 110—**Report to President.**

PLAINTIFFS' EXHIBIT NO. 111—**Award of Arbitration Board.**

PLAINTIFFS' EXHIBIT NO. 112—**Report of Public Service Commission.**

PLAINTIFFS' EXHIBIT NO. 113—**Report of Royal Commission.**

[Omitted From Appendix.]

PLAINTIFFS' EXHIBIT NO. 114—**Tables.**

CASUALTIES TO TRAIN AND ENGINE SERVICE EMPLOYEES IN TRAIN AND TRAIN-SERVICE ACCIDENTS AND CASUALTY RATES PER MILLION MAN-HOURS
YEARS 1963, 1964 and 1965

Eighteen Classes of Operating Employees - Class I Line-Haul Railroads

Class of Employees	Casualties in train accidents						Casualties in train and train-service accidents					
	Fatalities			Casualties (including fatalities)			Fatalities			Casualties (including fatalities)		
	1963	1964	1965	1963	1964	1965	1963	1964	1965	1963	1964	1965
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
111 Passenger conductors	-	1	1	14	9	6	-	2	1	100	106	84
112 Asst. psgr. conductors	-	-	-	4	1	1	-	-	-	41	25	48
113 Thru freight conductors	1	2	1	34	36	43	4	2	2	441	476	420
114 Local frt. conductors	-	2	2	22	25	25	3	4	5	449	491	478
115 Passenger baggagemen	-	-	-	3	4	3	-	-	-	77	67	41
116 Passenger brakemen	-	-	-	10	17	10	2	-	-	265	273	262
117 Thru frt. brakemen	3	5	8	86	68	67	7	12	14	1,083	1,008	983
118 Local frt. brakemen	2	2	-	46	31	49	14	8	9	1,543	1,613	1,575
119 Yard conductors	-	-	1	5	19	8	12	6	10	857	911	907
120 Yard brakemen	-	1	2	22	30	27	23	20	25	3,399	3,546	3,420
121 Passenger engineers	1	5	2	20	24	16	2	5	3	83	85	66
122 Thru frt. engineers	3	3	4	25	26	30	3	3	4	125	130	140
123 Local frt. engineers	1	2	2	16	19	15	2	2	3	101	136	115
124 Yard engineers	-	3	-	10	18	16	-	3	-	203	252	258
125 Passenger firemen	-	2	2	16	15	18	-	2	3	86	107	92
126 Thru frt. firemen	2	5	2	31	24	20	5	5	2	179	167	98
127 Local frt. firemen	2	-	1	11	12	8	2	-	1	112	97	62
128 Yard firemen	-	1	-	13	9	3	-	1	-	212	187	91
Total - 18 classes	15	34	28	388	387	365	79	75	82	9,356	9,677	9,140

Source: Table 103, I.C.C. Annual Accident Bulletins, 1963 and 1964.
(1965 from Advance Work Sheets prepared by the Commission).

CASUALTIES TO TRAIN AND ENGINE SERVICE EMPLOYEES IN TRAIN AND TRAIN-SERVICE ACCIDENTS AND CASUALTY RATES PER MILLION MAN-HOURS YEARS 1963, 1964 and 1965

Eighteen Classes of Operating Employees - Class I Line-Haul Railroads

Class of Employees		Man-hours (thousands)			Casualty rates in train and train-service accidents per million man-hours			Indices: 1963 = 100			
								Man-hours		Casualty rates	
		1963	1964	1965	1963	1964	1965	1964	1965	1964	1965
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
111	Passenger conductors	6,551	6,358	6,007	15.26	16.67	13.98	97.1	91.7	109.2	91.7
112	Asst. psgr. conductors	4,169	4,205	4,001	9.75	5.95	12.00	100.9	96.0	61.0	123.1
113	Thru freight conductors	12,102	12,861	13,152	36.44	37.01	31.93	106.3	108.7	101.6	87.6
114	Local frt. conductors	16,064	16,510	16,776	27.95	29.74	28.50	102.8	104.4	106.4	102.0
115	Passenger baggagemen	2,961	2,779	2,471	26.00	24.11	16.59	93.8	83.5	92.7	63.8
116	Passenger brakemen	6,470	6,215	5,633	40.96	43.93	46.51	96.0	87.1	107.3	113.5
117	Thru frt. brakemen	26,249	27,962	28,464	41.26	36.05	34.53	106.5	108.4	87.4	83.7
118	Local frt. brakemen	35,393	35,718	34,806	43.60	45.16	45.25	100.9	98.3	103.6	103.8
119	Yard conductors	40,305	40,958	41,466	21.26	22.24	21.87	101.6	102.9	104.6	102.9
120	Yard brakemen	82,792	83,307	79,631	41.05	42.57	42.95	100.6	96.2	103.7	104.6
121	Passenger engineers	6,962	6,714	6,302	11.92	12.66	10.47	96.4	96.4	106.2	87.8
122	Thru frt. engineers	12,932	13,834	14,464	9.67	9.40	9.68	107.0	111.8	97.2	100.1
123	Local frt. engineers	16,604	17,024	17,266	6.08	7.99	6.66	102.5	104.0	131.4	9.5
124	Yard engineers	37,226	37,772	38,347	6.45	6.67	6.73	101.5	103.0	122.4	123.5
125	Passenger firemen	5,638	5,431	50,75	15.25	21.08	18.13	96.3	90.0	138.2	118.9
126	Thru frt. firemen	12,847	11,763	8,787	13.93	14.20	11.15	91.6	68.4	101.9	80.0
127	Local frt. firemen	16,268	13,432	9,219	8.34	7.22	6.73	82.6	56.7	86.6	80.7
128	Yard firemen	36,784	28,361	18,123	5.76	6.59	5.02	77.1	49.3	114.4	87.2
	Total - 18 classes	378,317	371,204	349,990	24.73	26.07	26.12	98.1	92.5	105.4	105.6

EIGHTEEN CLASSES OF OPERATING EMPLOYEES - CLASS I LINE-HAUL RAILROADS

Year	Casualty rates in train and train-service accidents per million man-hours	
	Current man-hour weights	1963 man-hour weights
1963	24.73	24.73
1964	26.07	25.46
1965	26.12	24.79
Percentage change:		
1963 to 1964	+ 5.4%	+ 3.0%
1964 to 1965	+ 0.2	- 2.6
1963 to 1965	+ 5.6	+ 0.2

PLAINTIFFS' EXHIBIT NO. 115—**Photograph.**
[Omitted from Appendix.]

DEFENDANTS' EXHIBIT NO. 1—
Testimony of J. R. Henderson.

DEFENDANTS' EXHIBIT NO. 2—
Testimony of Kelly Bryant.

DEFENDANTS' EXHIBIT NO. 3—
Testimony of Kelly Bryant.

DEFENDANTS' EXHIBIT NO. 4—
Testimony of Frank W. Cannaday.

DEFENDANTS' EXHIBIT NO. 5—
Testimony of Norman F. Williams.

DEFENDANTS' EXHIBIT NO. 6—
Testimony of Jennie Furr.

DEFENDANTS' EXHIBIT NO. 7—
Testimony of Casey Laman.

DEFENDANTS' EXHIBIT NO. 8—
Testimony of Austin Franks.

DEFENDANTS' EXHIBIT NO. 9—
Testimony of Harold Falls.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 1—
Testimony of Alfred Acton, Jr.

My name is Alfred Acton, Jr., and I am employed by the Chicago, Rock Island and Pacific Railroad Company and have been so employed since May 29, 1953. I went to work as a fireman's helper and have been promoted to engineer on February 1, 1958. I have read Bobby Gene Hall's statement as to the conditions under which operations are conducted from El Dorado to Little Rock and back and from El Dorado to Crossett and back and I agree with the testimony that he has given in that regard.

Most of the trains which operate in and out of El Dorado operate with either the 400 class Alco engines or the 1200 and 1300 class EMD engines. It is very rare to have a GP-9 or GP-18 engine and we never have anything newer than GP-18.

It is one of the duties of the fireman to keep this engine motive power operational. In doing this it is necessary to patrol these engines while the train is on the road. We are not prohibited by company rules from moving between the units while the train is in motion. This is true on both the car body type engines and the GP type engines. The engines which operate over this territory are not kept in good working order. The nearest maintenance point for the EMD type engine is El Reno, Oklahoma. The nearest maintenance point for the Alco type engine is Little Rock, Arkansas.

I have prepared a list of the public road crossings between El Dorado and Haskell and between Haskell and Little Rock. This list shows the location of the crossings and the type of protection if any. This list is marked Exhibit A to my statement and is attached hereto and made a part hereof. I have also prepared a list of the duties of the fireman and that list is attached hereto and marked Exhibit B and is made a part hereof.

The territory over which we operate from Little Rock to El Dorado, from El Dorado to Crossett and from El Dorado south into Louisiana is a dark railroad without Automatic Block Signals or Centralized Traffic Control. Movements over these tracks are governed by train orders and time table and the other restrictions and instructions put out by the company. There are no hot box detectors on this territory and neither are there any dragging equipment detectors.

The engines that we currently operate over this territory are not all equipped with a dead man control pedal. We d not have any engines equipped with the alerter type train stop device in operation over our seniority district at the present time.

Most of our engines are equipped with the older type 6SL or 6BL brake equipment. We rarely ever have the 24 RL type brake equipment, and occasionally we have one with the 26L brake. The Chicago Rock Island and Pacific Railroad Company has a brake car on which instructions on air brakes are given. This car was in El Dorado in February of 1958 and was not there again until the summer of 1966.

From my experience as a fireman and as an operating engineer, it is my opinion that the presence of the fireman on these trains is absolutely necessary for the safety of the crew and of the general public.

Operation of these trains which range up to 160 cars in length is too great a responsibility to place solely on one man. There are too many things that this man has to take into consideration in the operation of this train for him to perform the operation with greatest safety to the crew and to the general public.

Exhibit A to Statement of Alfred Acton, Jr.

PUBLIC ROAD CROSSINGS
EL DORADO TO LITTLE ROCK.

	Location of Crossing						Protected	Type Protection
El Dorado	Mile	Post	L	100	Pole	14	Yes	Electric Gates, Bells and Lights
	"	"	L	99	"	5	Yes	Bells and Lights
	"	"	L	95	"	15	No	
	"	"	L	94	"	15	No	
	"	"	L	93	"	0	No	
	"	"	L	92	"	0	No	
	"	"	L	90	"	0	No	
	"	"	L	89	"	0	No	
	"	"	L	85	"	0	No	
	"	"	L	82	"	5	No	
	"	"	L	82	"	0	No	
	"	"	L	81	"	0	No	
	"	"	L	80	"	4	No	
	"	"	L	78	"	6	No	
	"	"	L	77	"	16	No	
	"	"	L	76	"	29	No	
	"	"	L	75	"	21	No	
	"	"	L	74	"	20	No	
	"	"	L	74	"	7	No	
	"	"	L	73	"	27	No	
Harrell	"	"	L	73	"	17	No	
	"	"	L	72	"	15	No	
Cram	"	"	L	70	"	22	No	
	"	"	L	69	"	12	No	
	"	"	L	67	"	9	No	
Tinsman	"	"	L	64	"	15	No	
	"	"	L	63	"	8	No	
	"	"	L	60	"	29	No	

	Location of Crossing	Protected	Type Protection
	Mile Post L 60 Pole 23	No	
	" " L 60 " 7	No	
	" " L 59 " 14	No	
	" " L 58 " 11	No	
	" " L 57 " 5	No	
	" " L 56 " 13	No	
	" " L 54 " 23	No	
	" " L 52 " 25	No	
	" " L 51 " 20	No	
	" " L 51 " 2	No	
	" " L 50 " 23	No	
	" " L 48 " 10	No	
	" " L 43 " 21	No	
	" " L 42 " 15	No	
	" " L 41 " 9	No	
	" " L 40 " 14	No	
	" " L 39 " 18	No	
	" " L 38 " 18	No	
	" " L 36 " 14	No	
	" " L 36 " 6	No	
	" " L 34 " 24	No	
	" " L 34 " 0	No	
Carthage	" " L 32 " 22	No	
	" " L 30 " 10	No	
	" " L 30 " 6	No	
	" " L 27 " 25	No	
	" " L 25 " 22	No	
Leola	" " L 23 " 25	No	
	" " L 23 " 19	No	
	" " L 23 " 14	No	
	" " L 23 " 11	No	
	" " L 23 " 0	No	
	" " L 20 " 6	No	
	" " L 18 " 20	No	

	Location of Crossing					Protected	Type Protection
Thiel	Mile	Post	L	17	Pole	28 No	
	"	"	L	17	"	6 No	
	"	"	L	15	"	20 No	
	"	"	L	14	"	21 No	
	"	"	L	13	"	10 No	
	"	"	L	13	"	4 No	
	"	"	L	12	"	15 No	
Poyen	"	"	L	12	"	9 Yes	Electric Gates, Bells and Lights
	"	"	L	12	"	3 No	
	"	"	L	11	"	2 No	
	"	"	L	10	"	9 No	
	"	"	L	8	"	17 No	
	"	"	L	8	"	1 No	
	"	"	L	6	"	19 No	
	"	"	L	5	"	25 No	
	"	"	L	4	"	20 No	
	"	"	L	3	"	22 No	
	"	"	L	2	"	19 No	
Haskell	"	"	L	05	"	0 No	
	"	"	L	05	"	0 No	
	"	"	H	25	"	0 No	
	"	"	H	23	"	20 No	
Benton	"	"	H	23	"	4 No	
	"	"	H	21	"	25 Yes	Electric Lights and Bells
	"	"	H	21	"	8 Yes	Electric Lights and Bells
	"	"	H	20	"	25 No	
	"	"	H	20	"	0 No	
	"	"	H	19	"	9 No	
	"	"	H	19	"	2 No	
	"	"	H	18	"	28 No	

Location of Crossing						Protected	Type Protection
	Mile	Post	H	18	Pole 24	Yes	Electric Lights and Bells
	"	"	H	16	" 5	Yes	Flagman
	"	"	H	16	" 0	No	
	"	"	H	15	" 2	No	
	"	"	H	14	" 18	No	
	"	"	H	13	" 11	No	
	"	"	H	11	" 20	No	
Vimy Ridge	"	"	H	11	" 15	Yes	Electric Bell
	"	"	H	9	" 28	No	
	"	"	H	9	" 10	No	
	"	"	H	8	" 24	No	
	"	"	H	8	" 22	No	
	"	"	H	6	" 20	No	
	"	"	H	34	" 20	Yes	Electric Lights and Bell
Ward	"	"	H	3	" 5	No	
	"	"	H	2	" 19	No	
	"	"	H	2	" 0	Yes	Electric Lights and Bell
	"	"	H	1	" 22	No	
Hot Springs Junction	"	"	H	0	" 0	No	

Exhibit B to Statement of Alfred Acton, Jr.

FIREMAN'S DUTIES.

Firemen must report at the proper time when called. He must have a standard watch and compare it with the standard clock. If more than thirty seconds off, it must be set. He must read general orders, general notices and sign for same. He must read the bulletins on board and regis-

ter out on train register listing necessary information as required. He must keep in mind the new general orders and all the old general orders issued for that year. He must fully understand the time table and speed restrictions and special instructions listed in Pamphlet No. S-2.

He will receive a copy of train orders for the trip. He must check each part of the order to be sure that all is correct and that he has the right to proceed on the trip. If any error is found or any part of the order is confusing, it will be re-issued.

He then goes to the OK Track and boards the engine or engines. There are numerous things that have to be checked before he leaves the designated track. They are listed as follows:

On lead unit and all following units:

Check fuel supply.

Check lube oil.

Start Diesel Engine.

Check engine sand.

Check v-belts on Alco engines.

Check governor oil on both Alco and EMD engines.

Check water (cooling).

Check meter to see if battery is charging.

Check head lights, class lights and number lights.

Check emergency brake valve by fireman's slot.

Clean engineer and fireman's windows if needed.

Get on ground and check if all sanders are working and hitting rail.

Have engineer set auto brake valve and independent brake and see if all cylinders are cut in.

Drain main reservoirs of condensation.

Check to see if have a spare jumper cable.

Check to see if have a spare knuckle.

Check to see if have a spare air hoses.

Check to see if have a spare packing hooks.

Check to see if have spare wrench.

Check to see if have spare frogs.

Check lube oil pressure.

Check fuel oil pressure.

Check for loose or dragging parts on locomotive from ground.

Check traction motor inspection cover to be sure they are on. Very important.

Release hand brake.

Remove block or chain from rail under wheels.

Check cooling fan and shutters.

Check control air gauge.

Check fire extinguishers.

Check engine wheels for flat spots. Engineer or fireman must get on ground and the other one slowly move engine wheels completely revolve for visual inspection.

Properly set head light switch on lead unit and set following units so as can be operated from lead unit.

Check multiple unit air hoses between units and angle cocks to see if all are properly made and cut in.

Turn on 2-way radio and make a radio check.

Check horn and bell ringer.

Check trailing units to see if they are properly set up for trail.

Turn on head light on rear unit if have Alco engine because cannot turn on from lead unit.

Watch closely on fireman's side for anyone around engine when getting ready to move. Horn must be blown and bell rang before moving.

Get drinking water and ice, clean out water cooler and prepare water.

Check supply of fusees and torpedoes and red flag.

Keep a lookout and pass signals to engineer in putting engine on train. After engine is coupled to train watch for air men and for signal to set brakes.

Discuss train orders with engineer and have a proper understanding on their meaning.

After air is tested engineer will whistle off. Fireman observes position of switches.to be used.

On leaving the terminal and operating on the road, the firemen must perform the following duties:

Keep in mind all speed restrictions over territory you are running and call attention to engineer anytime you feel he is not complying with speed restrictions.

Fireman must keep a constant lookout to the head and must look to the rear and inspect his train around every curve and before arriving and leaving stations. He must also look back on straight track. He must look for protruding objects, loads shifted, hot boxes, dust, sparks and any other conditions that would affect his train.

At first opportunity the brakes must be tested on the road.

Be alert at road crossings and be sure engineer starts blowing horn and ringing bell at whistle (W) board. If about to have accident, fireman must pull emergency brake valve by his seat.

Observe all signals and call their indications.

Be prepared to go out and flag in either direction if conditions require it.

After passing last station approaching meeting and waiting points, see that engineer blows two longs and one short blast of the horn, as required by the operating rules. This is acknowledgment that he has not overlooked the meeting or waiting point.

Patrol all engines at every opportunity looking for defects. Record all trouble on work reports.

Answer any alarms enroute.

Pass signals to engineer when brakemen are working on fireman's side.

If an engine is picked up enroute, you must assist engineer in setting it up for multiple unit operation.

If an engine is set out, you must disconnect it from the consist and set brake and properly set it up for leaving it there.

If you have an engine failure and cannot set it out, you

must set it up for movement dead in train which consists of the following steps:

Move double heading cock to dead position.

Move auto brake valve handle to run position.

Move center reverser and lock with pin.

Cut in dead engine feature.

Set distributing valve, safety valve to 25#.

If temperature is below 40 degrees, engine must be left running if possible. If engine will not run, then the water must be drained from unit and a switch turned off and main battery must be pulled.

In starting a diesel engine, it sometimes takes two men. One on the start button and the other one handling the fuel lay shaft. Other times one man will have to push start button and other man has to push in on starting contactors with flag staff.

The things listed should be checked and there are numerous other things that can go wrong with a diesel engine on a trip. The fireman has to check into any trouble and if he cannot correct it, he is to call the road foreman or master mechanic and tell him how the engine is acting and from that he can be told what to try next.

Sometimes engines are run backing up and all signals and signs are on fireman's side of track. Fireman must call all signals to engineer.

If mile post numbers are on fireman's side of track, the fireman must help engineer check corrections of speed meter.

Fireman must help engineer in locating mile post numbers so restrictions can be complied with.

If engineer becomes sick or unable to control the engines, fireman must be prepared to take over the controls.

If engine needs water out on the road, the fireman will take water.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 1— Cross-Examination,

By Mr. Light:

Q. State your name, please? A. Alfred Acton, Jr.

Q. What is your labor affiliation, Mr. Acton? A. Fireman's Organization, B. L. F. and E.

Q. In the second sentence of your testimony you indicate that you went to work as a fireman's helper in 1953. Is that correct? A. That's right.

Q. Does this mean that you helped the fireman? A. The fireman helper designation has been put on the fireman only recently. At the time I hired out, the position was termed as a fireman.

Q. Did you do some work on a steam locomotive at that time? A. I never did work on a steam engine.

Q. Were steam locomotives in service on your railroad at the time you went to work? A. Yes, there was one shortly after I went to work and I made one student trip on the steam locomotive.

Q. When you made that student trip, did you observe whether there was a fire for the fireman to tend? A. I did.

Q. In 1953 when you became employed in the railroad industry, the title of your position was fireman, wasn't it? A. That is correct.

Q. And this term "fireman's helper" is one that has been adopted in recent years since dieselization of the railroads? A. That's right.

Q. You indicate that you are not prohibited by company rules for moving between the units while the train is in motion. Is there anything in the company rules that require you to move between units while the train is in motion? A. I have never seen anything that required me either to or not to.

Q. You state that the engines which operate over your territory are not kept in good working order. Do you know that the Interstate Commerce Commission requires

a certain minimum maintenance on locomotives used by your railroad? A. I do.

Q. Did you have any knowledge to the effect that that minimum maintenance is not maintained on the locomotives in your territory? A. I do not have any knowledge. I base my testimony on actual cases of failures on the road.

Q. Is it the duty of the engineer to report any malfunction on the locomotive? A. Yes, he is required to file that on form 164 at the completion of the trip.

Q. Is it your observation then that the mechanical forces attend to that malfunction after it has been so called to their attention? A. Some of them are took care of and some of them are not.

Q. Do the mechanical forces inspect the locomotives on arrival at the terminals? A. If there is a mechanical man on duty, they do.

Q. With regard to the deadman control pedal, you have operated on some locomotives that are equipped with that device, have you not? A. Yes.

Q. Have you worked on the Alexandria-Eunice local on the last couple of years? A. No, sir. It's been approximately six or seven years since I worked on that particular assignment.

Q. Have you worked in the Alexandria yard in the past couple of years? A. I don't recall that I have worked there in the last two years.

Q. In your listing of the fireman's duties, you indicate that he will receive a copy of the train orders for the trip. Is this a copy especially designated for the fireman? A. I don't think that it is particularly designated as the fireman.

Q. How many sets of copies of train orders are issued before the trip starts? A. Four sets.

Q. Two for the head end and two for the caboose? A. That's true.

Q. And all member of the train crew are under an obligation to familiarize themself with the contents of those orders? A. They are.

Q. Do you share your copy with the head brakeman? A. Yes. It is customary practice for the fireman in the engine to read the orders first. That could be past practice but they normally always do and then the head brakeman usually reads them after the fireman gets through with them.

Q. Mr. Acton, at the bottom of the first page of your listing of a fireman's duties, you have a number of things about the locomotive that you indicate that have to be checked before the train departs. It might be helpful if you would get a copy of your testimony before you. A. All right.

The Witness: That is in Exhibit B?

Mr. Ross: Yes, sir.

By Mr. Light: Q. You see that listing of six things I believe it is down there? A. Yes, sir.

Q. Isn't it primarily the engineer's duty to insure that those matters are in proper condition before the train departs? A. He usually checks with the fireman to see that they are.

Q. A qualified engineer knows how to make those checks, doesn't he? A. A qualified engineer knows how to make these particular checks.

Q. One of the things listed there is start diesel engine. Is that the duty of the fireman? A. It can be the duty of the fireman and engineer both. That depends on the engine because some of them you cannot start them by yourself.

Q. Well, on a diesel locomotive that can be started by one man, who does it? A. Normally the fireman does because he is the first man on the engine to check it over.

Q. You would say on the bulk of the runs you make as fireman you start the locomotive? A. If it is dead, I do.

We have instructions that if it is below forty degrees not to shut it down and so this is mostly during the Summer months or when the temperature is above forty degrees when the engines have to be started.

Q. Now, which type of locomotive requires two men to start it? A. Any locomotive that will not start when you push the start button.

Q. When the engineer pushes the start button and the locomotive doesn't start, what do you do as fireman to help get it started? A. As a rule, I go to the outside in the vicinity of the governor and push the lay shaft in with my hand if it is an E. M. D. engine, with my foot if it is an Alco.

Q. And then the engineer pushes the starter button and it should start? A. It should but it may not then because sometimes when you push the start button, the starting contactors do not pick up.

Q. And what do you do in that event? A. In that event, we gather up all the flag staffs we can find, two namely if we have got two or two sticks and while the man holds the lay shaft in, one man pushes with both stick and holds the starting contactors in until the engine starts.

Q. Now, this operation you have just finished describing takes how many men to perform? A. It takes two men to start one under that circumstance.

Q. Is there any reason why the head brakeman couldn't perform the service that you have just described? A. That is not a part of his duties. I have never seen one do it.

Q. Is that the only reason that occurs to you that a head brakeman cannot perform that service? A. Well, the engineer would possibly have to show him how to do either one of those duties.

Q. Of course, this operation you have just described, Mr. Acton, is not a complicated mechanical operation re-

quiring a lot of special training, is it? A. No, but a lot of those brakemen are afraid of the electricity because they have not been trained in it and don't understand it and they don't have any desire to push the starting contactors in if the engineer elected to have them push them in. They are scared of them.

Q. You are a qualified engineer, aren't you, sir? A. Yes, I am.

Q. You could show a brakeman how to do that operation, couldn't you? A. I possibly could.

Q. You can show me how, couldn't you? A. I don't know. I could try.

Q. How long did it take you to learn to perform that operation after you became employed as a fireman? A. I couldn't say what specific time because it takes a while to learn the sequence of the starting procedure on these engines and the first few months, I didn't know too much about the starting contactors.

Q. Well, during the first few months you were a fireman, was there any occasion on the runs you participated in to perform this operation to get the locomotive started? A. There was not because the engines was only about two or three years old and we wasn't having that type of trouble at that particular time.

Q. You state at Page 2 of your exhibit that one of the fireman's duties is to check the emergency brake valve by the fireman's slot? A. That should be seat.

Q. That is a typographical error? A. A typographical error and it should be seat.

Q. How do you go about checking that emergency brake valve before the trip starts? A. Just tripping the emergency brake valve handle.

Q. What does this do? A. It vents it to the atmosphere and puts the locomotive in emergency.

Q. Do you do that every instance before you start a trip with a locomotive? A. I do it on most every engine

I get on due to the fact that some persons, I couldn't say who, have a habit of putting debris down in those brake pipes and on a few instances when I have pulled those emergency brake valves from necessity, I've got a face full of trash and paper cups and other articles.

Q. Has any superior of yours with the railroad company ever advised you that it is your duty to check the emergency brake valve before you start a trip? A. I don't know if anyone has or not. I don't recall.

Q. Mr. Acton, you have listed in this exhibit quite a long list of duties that the fireman performs. Is that a fair statement? A. That is a fair statement.

Q. Have you taken that listing of duties from any written instructions published by the railroad company? A. No, only parts. I got parts of this information from the M. P. 141.

Q. What is that? A. That is a book on train and air brake communicating signal rules.

Q. And does that document you now have in your hand list any of these tasks as duties of the fireman? A. I couldn't say specifically it points them out in the manner that I have them here.

Q. Where did you get the rest of this information? A. Well, it's from information that has been handed down from the engineers to me and from other firemen that that was my duties and I have always tried to perform them.

Q. In this entire listing of duties that you have in Exhibit B, if the fireman were not present, who would perform them? A. The engineer would have to perform them if they were performed, the ones that he could such as starting the engine if possible. It might take two men as I stated before.

Q. You have indicated that there are a number of items of equipment such as jumper cables and knuckles and so forth that the fireman checks for before the trip begins? A. That's true.

Q. The fireman and engineer do not supply the locomotive, do they? A. That depends on whether any mechanical forces are on duty or not, particularly the air hose and wrenches and stuff of that nature. We do get them if there is not anybody down there and I have got several knuckles and put them on.

Q. On page 4 of your Exhibit B, you state that "The fireman must keep a constant lookout to the head end and must look to the rear to inspect his train around every curve". How do you go about doing that? A. Will you ask that question again?

Q. Yes, sir. Would you read the first sentence in the second paragraph on page 4? A. Do you want me to read it out loud?

Q. No, sir. Just read it to yourself. Have you read it? A. Yes.

Q. Now, how do you keep a constant lookout to the head and also look to the rear? A. You look towards the front and on curves you turn around and look briefly towards the rear and then back to the front. In other words, you can observe both directions in a matter of a very few seconds.

Q. You are not constantly looking to the head end when you are briefly looking to the rear, are you, Mr. Acton? A. No, not technically in the way you mean.

Q. Well, what do you mean by the word "constant"? A. The constant lookout to the head and look to the rear——

Mr. Lessenberry: He is not my witness but I am going to object to it because I think he has answered it.

The Witness: I don't know any other way to answer it than the way I have answered it.

By Mr. Light: Q. Well, as a matter of fact, your use of the word "constant" is just a little exaggeration there, wasn't it? A. I wouldn't say it was exaggeration. I would just say the statement wasn't very well worded.

Q. There is no duty imposed by the railroad company on a fireman any different from that imposed on all other members of the train crew to keep a lookout, is there, Mr. Acton? A. That's true but a man is trained to perform a certain job when he hires out on the railroad. A brakeman takes care of the braking and a fireman on any engine that I have ever been on will keep a better lookout than the brakeman because that is his particular job to do.

Q. How do you make a judgment on how good a lookout a man is keeping? A. He can be looking to the side or to the back when he could be looking ahead.

Q. And it is your testimony that it is your observation as a member of the engine crew that the fireman keeps a more vigilant lookout than any brakeman that might be riding in the cab. Is that right?

Mr. Ross: That is not what Mr. Acton said.

Mr. Light: I asked him if that is right.

Q. Is that your testimony, Mr. Acton? A. Do you want me to answer that?

Mr. Ross: You may answer, Mr. Acton, yes.

The Witness: The fireman is very observant of all things on his side of the locomotive. He watches ahead if the engine is moving ahead and if it is moving around a curve, he takes a quick look towards the rear and at the same time he tries to observe what is going on in front of the locomotive.

By Mr. Light: Q. What is the head brakeman doing during this time? A. On our end of the railroad, he may be on the ground because we have more local service than anything else. He is not even in the cab.

Q. When you are moving on the road between terminals, what is the head brakeman doing during this time that the fireman is keeping a lookout? A. He should be keeping a lookout on his own.

Q. Well, has it been your observation that he does or doesn't? A. Some of them are more observant than others.

Q. Do some of the brakemen that ride with you do a pretty poor job of keeping a lookout in your judgment, Mr. Acton? A. I didn't say they did a poor job of looking out. I just said that they wasn't trained like a fireman because a fireman is trained to watch everything at all times when that engine is moving.

Q. Do some of the brakemen that ride with you keep a poor lookout or do a poor job of keeping a lookout in your judgment?

Mr. Ross: I object to that question. Mr. Acton has answered Mr. Light's question in this regard already and pursuing the question is an effort to intimidate this witness and I object to it.

Mr. Light: You may answer, Mr. Acton.

Mr. Ross: Yes, you may answer, Mr. Acton.

The Witness: One of my duties is not to judge the effectiveness of the brakeman.

By Mr. Light: Q. Are you unable to answer the question, Mr. Acton? A. I am not unable to answer the question. I don't observe the brakeman all of the time because I am taking care of my own job.

Q. Do you ever see a brakeman riding in the cab of a locomotive on the road reading a newspaper? A. I don't recall any particular instance, no.

Q. I'm not asking you for the date and place. I am asking you if you ever recall such an event? A. It might have happened, yes. I don't recall any specific time.

Q. In your experience, you know that has happened though? A. It possibly has, yes.

Q. You indicate that one of the fireman's duties is to observe and call signals. Is that correct? A. That's right.

Q. Doesn't the rule require all members of the crew in the cab to do that very thing? A. It does. Now, there again, are we talking about between terminals or where?

Q. Well, the rule requires all members of the crew riding in the cab to do it at all times they are riding in

the cab, doesn't it, Mr. Acton? A. Yes, at the time they are in the cab.

Q. You state that a fireman must be prepared to flag in either direction if conditions require it. How long has it been since you went to the rear and flagged while working as a fireman? A. The only time that I recall was on a work train and I don't remember how long ago that has been.

Q. But that is the only time in your railroad career that you recall that happened? A. To flag to the rear. I have flagged to the head end on several occasions.

Q. How many times have you flagged to the head end in the last year? A. I haven't flagged on the head end in the last year because a lot of my service has been in the El Dorado yard and it wouldn't require it.

Q. Providing flag protection is normally the job of the brakeman, isn't it? A. Normally if he is available, yes.

Q. One of the items on page 5 that you indicate is done in isolating the diesel unit is set distributing valve, safety valve to twenty-five pounds. Now, is that something you have done? A. Yes.

Q. Don't you need tools to perform that operation? A. I have tools.

Q. Are they issued to you by the railroad company? A. No railroad company has ever issued any fireman any tools that I know anything about, but we do all have them and it has been suggested to us that we do have them and almost every man to a man has at least a pair of pliers of some description, a crescent wrench and they also have a pipe wrench of some nature. I have a sixteen inch aluminum wrench and some other small articles which I have used at times.

Q. When you experience a mechanical malfunction out on the road and are unable to correct it, what do you do? A. If you are unable to correct it, you will notify the master mechanic or the roundhouse foreman or the road fore-

man of equipment. In other words, you contact somebody in authority that knows something about a locomotive. You can describe the situation and, if he is able to, he will give you instructions on what to try and then you can call him back if this doesn't work, and he will possibly give you some more information. If that fails, then they will make the decision on what they will do.

Q. If they are unable to describe to you what to do on the telephone, they will send mechanical forces out to your aid, won't they? A. They will send mechanical forces to your aid if it is necessary to have the motive power or set the engine out and I might add in there that no one that I have ever met is able to correct all of these malfunctions on this engine.

Q. Have you ever had occasion to call Mr. Rich and tell him about a malfunction? A. I really don't know. I might have called Mr. Rich one or two times for an engineer.

Q. Was he able to help you out on those occasions? A. Mr. Rich is well informed on a diesel locomotive and I have studied a lot on them myself and I think Mr. Rich will verify it that he don't receive too many calls from me.

Q. When is the last time ~~when~~ an engineer on a locomotive that you were serving as fireman became disabled so that you were required to take over the controls? A. A short time ago the engineer got sick at the stomach and I relieved him for a distance of about fifty miles and he took some medicine and was able to return to his duties.

Q. He didn't become unconscious in that process, did he? A. He wasn't unconscious, but it would simply have been a situation of stopping and waiting on a man and delaying the entire job or me taking the train over.

Q. Have you ever had an occasion where an engineer became unconscious at the controls and you took over? A. No, I have never known of a man becoming unconscious, but I have relieved several engineers due to minor sickness and ailments.

Q. Have you performed any services for Rock Island in the last two or three years on crews consisting of less than six men? A. I believe at the time that they had the Full Crew Law suspended, I was in the yard and I don't remember working in Arkansas with less than a full crew.

Q. Have you worked in Louisiana with less than a six man crew? A. We have a six man crew on the south end pool turn that is my current assignment. One man, one brakeman goes fifty-five miles of the one hundred and forty-six mile run.

Q. This is between El Dorado and— A. And Alexandria.

Q. Alexandria, Louisiana? A. Right.

Q. You leave El Dorado with a six man crew? A. Right.

Q. And drop a brakeman? A. At Ruston.

Q. And that is about fifty-five miles of the run? A. Approximately fifty-five miles.

Q. Coming back north do you pick up a sixth member of the crew at Ruston? A. That's true.

Q. And come on in to Arkansas? A. That's true.

Q. So between Ruston and Alexandria the train is operated with a five man crew? A. That's right.

Q. Do you experience any difficulty getting over the road with that five man crew? A. It depends on whether you have any hotboxes or anything where you might need that particular brakeman. Yes, in some instances. If time is a factor and I understand that is what they want to do is move this freight.

Q. Between Ruston and Alexandria with a five man crew, have you ever encountered a situation where the five man crew couldn't do whatever work was required to move the train on to the terminal? A. Certainly it could be done with one man if he took enough time.

* * * *

Redirect Examination,

By Mr. Lessenberry:

Q. Do you switch Monsanto in El Dorado? A. No, sir.

Q. Do you pick up any cars there? A. No, sir, that is Missouri Pacific.

* * * *

INTERVENORS' EXHIBIT NO. 2—
Testimony of Bobby Gene Hall.

My name is Bobby Gene Hall and I am employed by the Chicago, Rock Island and Pacific Railroad Company. I went to work for the Rock Island in October of 1948 as a general clerk. I transferred to fireman in 1954 and in 1958 I was promoted to engineer. Prior to becoming an engineer I had to pass a written test on the air brakes and an oral test on the mechanical operations of the engines and on the book of rules.

I am presently operating as a fireman in local freight service between El Dorado and Little Rock. This train leaves El Dorado about 2:00 a. m. in the morning. There is a train from Little Rock to El Dorado operating over this same track that leaves Little Rock about 9:00 a. m. in the morning. The average time it takes a train between Little Rock and El Dorado is from ten to twelve hours per day. Our normal engine consist for this trip to Little Rock is three units. These locomotives are of the GP type and we are usually pulling anywhere from 90 to 160 cars.

Movement over the track between El Dorado and Little Rock is by train order and time table. We do not have Automatic Block Signals or Centralized Traffic Control.

On leaving El Dorado our first stop would be Calion, Arkansas, switching the Calion Lumber Company. In switching the Calion Lumber Company, the track leading

to this plant is in the shape of an "S" curve and it is necessary to pass signals on the fireman's side. Switching here is done over one public crossing and the crossing will be flagged by a brakeman when we are shoving across it. When the engine heads over the crossing it is the duty of the fireman and engineer to watch traffic here. Calion is not a regular stop for this train, but we do stop there occasionally.

Our next stop is Tinsman, Arkansas, where we switch over one unprotected crossing going northward and also one unprotected crossing going southward. It is up to the fireman and engineer to keep a lookout on this crossing. On the north trip signals would be passed on the engineer's side at Tinsman, but on the return trip from Little Rock to El Dorado, signals would have to be passed on the fireman's side because of the curvature of the track.

At Fordyce we cut anywhere from fifteen to forty cars off and leave the remainder of our train on the main track just south of a public road crossing until we finish switching Fordyce. The rear brakeman will make this cut and then signal to go ahead on the fireman's side. We then pull on up the track to the Cotton Belt crossing which is an automatic block at that crossing and the swing brakeman drops off and walks to the Cotton Belt main line and calls the dispatcher on the phone to get time limits within which we may operate over and beyond the crossing on Cotton Belt track.

The conductor will usually stay with the cut of cars on the main track. It is necessary to flag to the rear of this train unless we have a protective order. A protective order is a train order stating that northward extra trains wait at El Dorado until a certain time. Then until that time arrives, we do not have to flag to the rear of the train. If we do not have a protective order or if the time designated on the protective order has

expired, then we will have to provide a flagman to the rear of our train while we are stopped.

The swingman will secure the track and time limits from this dispatcher so that we will know how long we have to operate on this Cotton Belt track. The rear brakeman drops off at a road crossing just north of the Cotton Belt Railroad crossing. He walks down that road to a public crossing. The head brakeman drops off at the depot and lines the switches leading to the Cotton Belt interchange. When the head brakeman lines the main line switch and gives the signal for the train to back up, the signal has to be given on the fireman's side. The fireman relays the signals to the engineer and they back up and the first crossing is flagged. The rear brakeman flags there and he waits for signals from the swingman to get time limits to find out what the time limits are. When he gets the track and time limits he notifies the head brakeman and the engine crew is notified of the amount of time which they have to make the delivery at the Cotton Belt.

The head brakeman gets off at the Cotton Belt main line switch and stays there. The rear brakeman gets the derail on the side of the track and then gives signals to back up. The rear brakeman gets on the cut of cars that are being shoved. The derail is a device that is hinged and can be laid across the track. It has a groove that will derail a car when a car is shoved or rolls over it. The rear brakeman gets on the cut of cars being shoved and the swing brakeman passes signals. We then move back over the Cotton Belt crossing if we have completed our work in the time given us by the CTC operator. If our time has expired, then we will again have to call the CTC operator to get permission to go over this track.

After leaving Cotton Belt interchange our train moves back over to the Rock Island Yard and we go to the north part of the yard and usually switch there anywhere

from one to four hours. There is a motor wheel track loading off our main line that leads off to the fireman's side. The track is curved and signals have to be passed on the fireman's side, and in moving on down to the casket company we have to cross six public crossings none of which are protected and all of which must be flagged when we are shoving over them. During these moves the head brakeman stays at the main line switches which have to be attended at all times here. The other two brakemen will pass the signals before the move on the fireman's side.

The train then must return to the cut of cars it left on the main track on entering Fordyce. The rear brakeman will get on the rear car and the train starts backing to get the cut of cars. We pass over two road crossings and we will have to stop at the automatic block signals for the Cotton Belt Railroad crossing. This signal is on the fireman's side making this move. We go over two more public crossings in this back up movement with cars and before you couple up with the train on the main line you have a right hand curve and the rear brakeman will make the joint from the fireman's side and couple the cars into the fireman's side because of the curvature of the track.

The train then proceeds forward again going through the automatic block interlocking with the Cotton Belt Railroad and move on to Leola, Arkansas. At Leola the head brakeman and the swing brakeman are the only train crew members on the head end here. The conductor and rear brakeman are on the caboose which is anywhere from three-quarters of a mile to a mile and a half back. In switching Wilson Mill here signals are passed on the engineer's side going north. Coming south signals would be passed on the fireman's side because of the direction of the train and location of the tracks. Next switching is on the house track at Leola. That track is switched daily and on the northward trip signals would be passed on

the engineer's side, but on the southward trip signals would be passed on the fireman's side because of the location of the track. On the house track the train moves on to switch the pole drying plant. The track here is on a sharp turnout on the fireman's side and signals have to be passed on the fireman's side.

The train then proceeds on to mile post 22 which is still in Leola and we switch Toler Lumber Company. This track is on a very sharp turn leading out on the fireman's side and signals could not possibly be passed on the engineer's side. After switching is completed here the train returns to the main line to get the cars it had cut and left there when it began switching. The train has to back on the main line and in a backward move the train moves over five public road crossings with 10 to 20 cars. The swing brakeman is on the rear or lead car being shoved and the head brakeman somewhere between the engine and the rear of the cars passing signals to the engine crew. The fireman aids in watching the crossings on his side of the train. We usually switch here about two to three hours going northward. We couple onto the train and proceed northward the next stop being Haskell, Arkansas. In switching at Haskell going northward signals are passed on the engineer's side but on a southbound train the signals would be passed on the fireman's side because of the curvature of the track.

On leaving Haskell the next stop would be Benton. We do not always stop at Benton but if we do we would switch a house track and it is located on the fireman's side going northward. The trainmen could move over and cross the track to the engineer's side to pass signals here.

After Benton we stop at Bauxite. At Bauxite we are working in the yard limits at restricted speed. There are several right and left hand curves which we go through and we move over several road crossings. We go past the

depot and stop at the north end of the yard on a right hand curve and usually the train will be cut approximately 15 to 20 cars with signals passed on the engineer's side and then we back into the Rock Island yard and sometimes do one to two hours switching there. Sometimes it is necessary that we go out of the Bauxite yard into the Rock Island passing track which is switched on the fireman's side and the signals are given to the fireman to relay to the engineer. From there we go into the Reynolds Metals plant. In moving in there we have a big left hand curve and signals going into that plant have to be passed on the fireman's side because of the curve. We perform several hours switching here and some of the signals for the moves must be given on the fireman's side and some of the engineer's side. After we leave Bauxite we move on to Little Rock and put our train away.

Most of our locomotives are equipped with radios but the radios on the cabooses are usually of the walky-talky type and the crewmen in the caboose cannot be called from the engine. The caboose radios can be used to call the engine crew and then they will be able to talk with each other but the engine crew is not able to call the men in the caboose.

Since we operate over a dark railroad, that is, one without Automatic Block Signals or Centralized Traffic Control, we operate by time table and train orders. In operating over this road, the engine crew has to keep in mind the uniform code of operating rules which is supplied from time to time with a supplement with new rules; has to keep in mind the S-2 booklet which contains speed restrictions and special instructions; we have to take into consideration the time table which also includes special instructions and restrictions; we have to take into consideration the general orders and these will include any changes or additions to the uniform code of operating rules, the time table and the S-2 booklet of speed restrictions and

other special instructions; we have to keep in consideration the general notices; and we have to keep in mind the train orders which we receive daily. These train orders are issued at the originating terminal and at intermediate stations along the route. The train orders are in effect until fulfilled, superseded or annulled.

On January 9 while operating on train No. 36 from El Dorado to Little Rock, we received ten different train orders, many of which had several different parts, which we had to keep in mind in operating our train from El Dorado to Little Rock. At El Dorado we received a clearance slip with seven train orders attached. At Fordyce we received a clearance ship with two train orders attached. At Leola we received a clearance slip with one train order attached. The number of these train orders are as follows:

> No. 771, No. 793, No. 406, No. 407, No. 408, No. 425, No. 426, No. 477, No. 479 and No. 507.

These train orders are attached hereto and marked as Exhibit A, pages 1-13, to my statement.

There is no limit to the number of train orders which may be issued governing the move of a train between El Dorado and Little Rock or any train on our line for that matter, the ten train orders which we received on January 9 is not an unusual number.

On January 7, while operating No. 36 between El Dorado and Little Rock, we received seven train orders. The numbers of which are:

> No. 771, No. 776, No. 441, No. 442, No. 443, No. 452, and No. 453.

all of which are attached hereto and marked as Exhibit B to my statement.

We have to keep in mind and comply with TRAIN AIR BRAKE AND COMMUNICATING SIGNAL RULES,

which is known as our MP 141 book. This book contains a total of 211 pages of rules and instructions.

We have to keep in mind and comply with our diesel operating manuals and comply with those instructions.

We also have another condition that exists on this division and that is crews are doubled out of terminals with only eight hours off duty time. Crews working El Dorado to Little Rock usually have a very short layover in El Dorado. Example: Crew works Little Rock to El Dorado, on duty 10 to 12 hours and ties up in El Dorado at 6:00 p. m. He will be called to go back to Little Rock for 2:00 a. m. Out of this 8 hours off duty time the man has to drive home, eat supper, bathe, get to bed and get to sleep. He will be called at 12:30 a. m. for a 2:00 a. m. call. Out of this 8 hours off duty a man cannot get more than 4½ hours sleep and he is up for another 10 to 12 hours of work. We are already tired and sleepy before we even leave our terminal. We have this same short rest problem at Crossett, Arkansas, Winnfield, Louisiana and Alexandria, Louisiana. The jobs operate out of Arkansas that run into Winnfield and Alexandria.

I am also familiar with the local train which runs from El Dorado to Crossett having worked over this territory. From El Dorado to Tinsman this local works over this same track as does the local from El Dorado to Little Rock and between those two points, El Dorado and Tinsman, this local will do the same switching as does the El Dorado to Little Rock local with an additional three switching points. This local will switch the Arkansas Power and Light Company spur located at mile post 92 between El Dorado and Calion and it switches at Harrell, Arkansas, and at Cram.

At Cram the switching is performed at the St. Francis Gravel Company. Part of this work is done on the engineer's side and part of it is done on the fireman's side because of the curvature of the track. The part of the

work that is done on the fireman's side necessitates the passing of signals to the fireman for relaying to the engineer as this could not be done on the engineer's side. We perform switching at Tinsman and when the train is headed south, the switching must be done on the fireman's side and signals passed to the fireman for relaying to the engineer. When we get to Crossett we run over three public crossings that are not protected and must switch over Highway 82 in putting the train away. There are numerous curves and numerous public crossings which have to be watched closely on this territory.

It is my opinion that the fireman is necessary for the safety of the operation of these trains. The fireman must help the engineer in keeping a lookout to the front and to the sides and to the rear of the train. The engineer often has limited vision to the front and left of the train because of the construction of the engine. In switching operations it is essential that a fireman be present in order to pass signals from the brakeman when necessary and in order to keep a lookout at the crossings over which the train is operating. During the switching operations it is necessary at times for the engineer to be watching to the rear to take signals from the trainmen. At these times the train may be moving back and forth over public crossings. It is impossible for the engineer to keep a lookout at public crossings and for signals from the members of the crew at the same time. The fireman is also the only person available who is qualified to relieve the engineer and qualified to help the engineer maintain the motive power of the train. The engineer has too many things to think about and too many things to remember to be left alone in the engine to operate the train. Because of the many train orders and other special instructions and orders it is very necessary that the fireman be present in order to call the engineer's attention to anything which he might overlook and to help the engineer

keep a lookout for both the crew members and the general public when moves are being made.

[Exhibits to Testimony Omitted From Appendix.]

PLAINTIFFS' REBUTTAL EXHIBIT NO. 2—

Cross-Examination

By Mr. Light:

Q. State your name, please, sir. A. Bobby Gene Hall.

Q. Where do you live, Mr. Hall? A. 2902 Oak Lane, El Dorado, Arkansas.

Q. What is your union affiliation? A. I am Local Chairman of B. L. F. and E.

Q. Brotherhood of Firemen and Enginemen? A. Yes, sir.

Q. What is your present assignment? A. I'm working as a fireman-helper on the local operating between El Dorado, Arkansas and Crossett, Arkansas, working six days a week and off Sundays in El Dorado.

Q. You describe in your testimony filed in this case the local freight run from El Dorado to Little Rock and make the statement that at Tinsman signals have to be passed on the fireman's side on the south bound trip. Is that correct? A. That's correct.

Q. Why? A. Because of the curvature of the track. You have a long left handed curve and then sweeping back to the right and it has to be passed on that side.

Q. How many cars do you usually handle there at Tinsman? A. Sometimes we cut maybe between forty and sometimes it is even more than that, maybe sixty or something like that.

Q. You set out that many cars there? A. Well, we have a set-out there of all the way up to forty-five cars, but we pick up cars enroute at Haskell, maybe twenty for El Dorado, and then we will pick up again at Fordyce and all of the cars that we are holding to switch with do not set-out at Tinsman, but go on to El Dorado.

Q. How many cars do you normally set out at Tinsman on the south bound trip? A. It would average anywhere from twenty-five to fifty.

Q. Do you pick up there too on the south bound trip? A. No, sir, usually we don't.

Q. When you set out this string of twenty-five to fifty cars at Tinsman, how many men do you have on the ground passing signals? A. At this point we have three men.

Q. All on the fireman's side? A. Yes, sir.

Q. At this time where is the conductor, in the caboose? A. That's correct.

Q. And he's far enough removed from where the switching operation is going on that he does not participate in it, is that right? A. That's correct.

Q. Now, if you just had ten cars to set out there at Tinsman, could the signals be passed from the engineer's side? A. If you were only holding on to ten, yes, they could.

Q. And how many men would you need to pass signals on the engineer's side if you just had hold of ten cars? A. Well, now, one brakeman is going to have to stop back and clear the yard to make the cut.

Q. What do you mean by that statement you just made? A. Well, these ten cars we are going to set out is going to be cut away from the train. He gets there and then you will have another man that will get off at the switch to line the switch or that man that made the cut could ride up there.

Q. Making the cut just means lifting a pin, doesn't it? A. That's right.

Q. He lifts the pin and then he can ride on up to the switch and throw the switch. Isn't that correct? A. That's right, yeah.

Q. And when he does both of these operations, he gives an appropriate signal to the engineer, doesn't he? A.

Well, it would take two men to make the move even with just ten cars.

Q. Two men on the ground? A. Yes.

Q. All right, what is the other one going to be doing? You described one as lifting the pin and one riding the cut and throwing the switch. What is the other one going to do? A. Well, he would be participating in this passing signals, but usually we don't hardly ever set out ten cars at Tinsman.

Q. Do you mean that you would have to have some one to pass signals if you just had ten cars? A. Sure, somebody is going to have to give the signals. If there's one car, somebody's going to have to give the signal to the engineer.

Q. Yes, sir, I agree with you, but why couldn't this man that is throwing the switch give the signal? A. He could give the signal, yes, sir.

Q. If you just had ten cars, you would just need one man on the ground to perform this operation, wouldn't you? A. Well, now, you can be shoving in that yard and you might have to make a joint down there. You are going to have, take one man to make that joint and going into the yard there it is a right handed curve to the north and it would take two men that way if you were shoving a clear track, one man could do it.

Q. Well, now, what's involved in making a joint as you say? Is this merely coupling into some cars that are already standing on the track? A. Yeah, that's correct and also the knuckle would have to be opened and you would have to see that the joint did make and you would have to stretch it to be sure that you were a hold of those cars.

Q. Why couldn't this man that threw the switch walk down and do that? A. Because it's a short right hand curve to the north and the engineer couldn't see him if he was back in there doing that.

Q. So, if you had to make the joint, it would take two

men on the ground? A. That's correct. I would like to further state that the last trip I worked into Tinsman there was, I would estimate at least fifty cars set out by this train 35 on the previous day.

Q. I might suggest, Mr. Hall, that we will be here a lot less time if you will just answer my questions. A. All right.

Q. Mr. Hall, on Page 2 of your testimony you refer to the switching operations of this train at Fordyce and state that "It is necessary to flag the rear of the train unless we have a protective order". Is that correct? A. Yes, if the train is outside the yard limit board.

Q. Yes, but as a matter of fact, the switching operations at Fordyce are carried on within the yards, aren't they? A. Yes, but with a long train your caboose will hang out of the yard limits at times.

Q. How many times have you had a train so long at Fordyce that it stuck out of the yard limits? A. There has been many, many, many times.

Q. When did you last make this trip? A. You mean when it stuck out or the last time I worked on it?

Q. The last time you worked on it when it did stick out? A. I can't give you that information because I can't remember what the train consist was, but it could happen.

Q. How far are the yard limits from the crossing down there? A. I would say that it is less than a mile.

Q. And if you have a protective order, even if your train is out of yard limits, it is unnecessary to flag? Isn't that right? A. Yes, during the time so specified in the protective order.

Q. When you talk about cutting the train after arrival at Fordyce, you say, "The rear brakeman makes this cut and then signals go ahead on the fireman's side". Why does he pass that signal on the fireman's side? A. Because there is a long sweeping—no, I'll change that. It is a short sweeping left hand curve.

Q. How many men would it take on the ground to pass that signal from the man who made the cut to the engineer on the engineer's side? A. It would take two men.

Q. The man who made the cut and then a man, let's say, half way between him and the engine? A. That's right.

Q. You describe on Page 3 of your testimony a switching operation conducted on the Cotton Belt track? A. Yes, sir.

Q. The description you give of the swingman's activities are that "He secures the track in time limits from the dispatcher" and when he gets that information he communicates it to the balance of the crew and as I read your description that is all he does in this operation. Is there anything else that he does? A. Yes, he will stay with that Cotton Belt main line switch so if we run into trouble in making the delivery and our track in time runs out, then he can line that switch because we are down there approximately half a mile in another track.

Q. There is not any rule that requires him to stay there, is there, Mr. Hall? A. Yes, sir, I am sure the rule requires that.

Q. Could you cite me to that rule? A. We have a rule that says main line switches will not be left unattended.

Q. This is C. T. C. territory, isn't it? A. Yes, sir.

Q. Isn't the rule that the switch will be attended or that the car will be left on the track? Let me revise that question. Isn't it the rule that the switch will be left open in C. T. C. territory or the car will be left on the track? A. Yes. The switch will be left open as long as we are making this move, but if we run into trouble a half a mile down making this delivery and our track and time limit runs out, then we lock up in that track we are shoving it to and the brakeman staying at that switch will line that switch and lock it back also.

Q. How much time do you usually get when you get track and time limits at this point? A. Anywhere from

fifteen minutes to an hour, usually about twenty or twenty-five minutes.

Q. If you got down there and had some difficulty, it wouldn't take a healthy man very long to walk that half mile back to the switch, would it? A. No, it wouldn't take him very long to walk or run. It is just according to how much time he has.

Q. What does the conductor do during the time this switching operation on the Cotton Belt track is going on? A. He's on the caboose doing his necessary work.

Q. Well, now, as an engineer, you haven't had many opportunities to observe what he does on the caboose, have you? A. No.

Q. Really all you know of your own personal knowledge is that he is on the caboose and you don't know what he is doing? Is that right? A. That's right.

Q. You describe going on up into the Rock Island yard at Fordyce and state that the track is curved and signals have to be passed on the fireman's side. Isn't that a moderate curve, Mr. Hall? A. What page and paragraph are you on there. I didn't quite get your question.

Q. Page 4, the first full paragraph. A. In that statement we go to the north part of the yard and switch and then the second sentence about the motor wheel. That motor wheel track leading off to the main line is not in the north yard. That is south of town. That is another track.

Q. Then, the next sentence is the one I have reference to. "The track is curved there and signals have to be passed on the fireman's side."? A. That sentence is referring to the motor wheel track which is south of the depot there, south of the Cotton Belt crossing.

Q. How many cars are the maximum you could handle on that motor wheel track and still pass signals on the engineer's side? A. We usually go in there with two or three cars and then we couple up to an industry around

there that loads wood, I mean lumber which might be two or three cars there and I believe four or five would be the maximum amount of cars that we handle and in flagging these crossings two men could work on the engineer's side and pass them.

Q. Handling the four or five cars that you typically handle on that track. Is that right? A. That's right.

Q. A little further down in that paragraph you say, "During these moves the head brakeman stays at the main line switches which have to be attended at all times herein". Now, is that correct? A. Yes, you don't leave main line switches unattended. We have a rule that says that. Of course, you could line and lock it back.

Q. Well, if it were lined and locked back, then the head brakeman could come on and help with the switching, couldn't he? A. Yes.

Q. And as a matter of fact, you left your train up there on the main line, didn't you? A. Yes, sir, about a mile south of that.

Q. You refer in the last paragraph of Page 4 to a signal that is a part of the automatic block signal system and say, "This signal is on the fireman's side making this move". Now, do you mean to imply that the engineer can't see it because it is on the fireman's side? A. That's right.

Q. Where is that signal physically located with reference to the track? A. It is located on the west side of the track approximately fifteen feet from the main line, Rock Island main line, and approximately forty feet north of the Cotton Belt main line. The engineer at this point is on the east side of the track.

Q. It is located about fifteen feet from the center of the track? A. No, from the west rail.

Q. From the west rail? A. Yes.

Q. And how high off the ground? A. Approximately twelve feet, fourteen.

Q. How close does the engineer need to get to that signal before he can see it? A. He can never see it from his side.

Q. Do you have a brakeman riding the diesel unit at this time? A. Yes.

Q. Where is he? A. Usually on the rear step or platform on the third unit.

Q. From that position can that brakeman see the signal? A. He could if he was on the west side, the opposite side of the engineer, he could see it.

Q. Could the engineer see the brakeman if he were in that position? A. No.

Q. If the brakeman rode on the point of the unit, could he see the signal? A. I don't understand.

Q. The leading end of the movement? A. The car?

Q. Yes, what you are doing is shoving a car in here, aren't you? A. Yeah.

Q. If he rode on the leading end of that lead car, could he see the signal? A. Yes, he could see it.

Q. And if he were on the right side of the car, the engineer could see the brakeman, couldn't he? A. No. If he could see the brakeman, he could see the signal.

Q. I suppose this brakeman could stand on the ground where he could see the signal and where the engineer could also see him, couldn't he? A. Yes, he could stand just before you get to the signal and see it change and pass it on to him, yes.

Q. On Page 9 of your testimony, you indicate that on occasion you have short lay-overs at El Dorado where you don't have much more than your mandatory eight hours rest time. Does that still prevail on this run or do you know? A. Yes, it still prevails.

Q. Now, at North Little Rock on that run, is the lay-over longer? A. That run doesn't run into North Little Rock.

Q. I mean Little Rock? A. The run actually runs into Biddle, Arkansas.

Q. This is the Biddle Shops in the south end of Little Rock? A. That's right, yeah.

Q. Is your layover on this end longer than the one at El Dorado typically? A. Oh, yes.

Q. This is the long end of the layover up here, isn't it? A. Away from home, yes.

Q. Mr. Hall, in the past couple of years have you worked as an engineman anywhere outside of the State of Arkansas? A. In two years did you say?

Q. In the past couple of years, yes, sir? A. Less than ten trips.

Q. Where would those be? A. I worked the local from El Dorado to Winfield about two or three trips and a trip Alexandria—El Dorado to Alexandria two or three trips.

Q. Are you familiar with the switch engine that is operated between Alexandria and Eunice? A. I have worked that job several years back, yes.

Q. What size crew did they use when you worked it? A. A five man crew.

Q. Engineer, fireman and three switchmen? A. No, engineer, fireman, conductor and two brakemen.

Q. What size crew do they use now? A. At the present time an engineer, conductor and one brakeman but there is times through the year they have five on there though.

Q. During heavy harvest season and that sort of thing? A. No, during a rule that came out of the Arbitration 282 that protects the men for work. They can go down and work that job.

Q. Mr. Hall, in reading your statement, I don't believe that I saw any testimony about the activities of a fireman in correcting mechanical and electrical malfunctions on a diesel locomotive. Is that correct? I haven't overlooked something that you do say about that, have I? A. I believe on Page 10 I state "The fireman is also the only person available who is qualified to relieve the engineer and qualified to help engineer maintain the motive power of

the train" and that motive power of the train would be correcting malfunctions there.

Q. What part of your statement is that on. I can't locate it.

* * * *

A. Page 11, that's right.

Q. What is the fireman's duty to help the engineer maintain the motive power of the train that a brakeman couldn't do? A. The fireman is trained and qualified for this type of work and the brakeman is not.

Q. I will repeat my question. What can the fireman do to help the engineer maintain motive power that a brakeman couldn't do? A. The brakemen that I work with I do not believe could even start a locomotive.

Q. Is that one or more brakemen you have reference to? A. That is all of the brakemen.

Q. Give me the names of some of these brakemen you don't think could start a locomotive? A. D. N. Shirey, I. C. Davis, K. W. Hall, Q. J. Brumley, J. R. Brumley, H. K. Matthews, C. C. Matthews, R. D. Matthews, Jerry Matthews.

Q. That's enough, Mr. Hall. I think Mr. L. W. Walker is going to testify right after you, no, that is L. T. Walker? A. I don't work with Mr. Walker on my seniority district. I just wouldn't know.

Q. But it is your testimony that none of the brakemen you know could start a locomotive? A. The ones I mentioned to you couldn't.

Q. You think those brakemen you mentioned could start a locomotive if a qualified engineer were present and instructed them as to how it was done? A. If he showed him each thing and told him just what to do with it, well, anybody could.

Q. You start a locomotive by pushing a starter button, don't you? A. No, sir, there is a lot more to it than that.

Q. Is it a difficult task that takes a lot of skill and

training? A. You have to study so you will know just what to do to start one.

Q. Does it take more intellectual effort to start a locomotive than it does a passenger automobile? A. Yes, much, much more.

Q. Would you just tell me what you do to start a locomotive that is so difficult? A. Well, the first thing you do is mash the main battery switch in. You turn on the control, turn on the fuel pump and if the engine has been shut down more than two hours you will open the cylinder test cocks. You will put the oscillation switch on start and, if you have got these cylinder test cocks open, you will turn that fuel pump back off. Then the engineer will bump the start button two or three times while the man holds the lay shaft closed.

Q. Is this done in every instance when you start a locomotive? A. If it has been tied up more than two hours, yes, it's done, supposed to be done.

Q. This is on a certain class of engines? A. Yes, the M. D.

Q. Have you finished? A. No, I haven't finished. Then, you will mash the start button and if the engine rotates, it will start but if it doesn't rotate, then you have to go out to the back side of the cabinet and take a couple of flag sticks, mash the starting contactors in while the engineer is mashing the button and you might start it there but if you mash the start button and it won't start, then there are several things that you have to check, namely, the main battery starting fuse, the starting fuse, four hundred amp and then you might get the engine started and it will die with you a few seconds and then there is things you will have to check to see why it died.

Q. Did you learn how to start a locomotive when you were a fireman? A. Yes.

Q. How long did it take you to learn how to start a locomotive after you became a fireman? A. It took quite a while before I fully understood how to start one.

Q. As much as a week? A. Oh, I'd say it was two or three months there before I really understood it. You see, this was all new to me and I was taking it all, had to take it all at once.

Q. On some of the runs that you have worked for Rock Island, have you had occasion to observe the operations of the Warren and Ouachita Valley Railway Company down in Bradley County? A. No, sir, I never have observed it, no, sir.

Q. Have you ever worked on that part of the Rock Island that runs to Warren? A. No.

Q. Well, then—— A. That's off our seniority district.

Q. Have you worked on that part of the Rock Island that runs from Tinsman down to Crossett? A. Yes, sir.

Q. That is the one you are on now, isn't it? A. Yes, sir.

Q. Don't you interchange with the Warren and Ouachita Valley near Banks? A. Yes, we go through there about four or five o'clock and set cars out.

Q. And pick up? A. A. M. and pick up but I don't never see the W. and O. V. crews then. They are not there then. I don't know what time they get there.

Q. You don't know what size crew is used on the W. and O. V.? A. No, sir, I don't.

Q. How about the Warren and Saline River. Are you familiar with that railroad operation? A. No, sir. It's been ten years since I even saw their engine. They run in daytime and run at night.

Q. How about the Fordyce and Princeton Railroad over at Fordyce. Have you ever seen them operating their locomotive? A. I see them coming over in our yard with one or two cars.

Q. What size crews do they have on their switching operation when you see it? A. I would just guess from seeing it they have got an engineer and two colored brakemen.

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Redirect Examination.

By Mr. Ross:

Q. Mr. Hall, the C. T. C., centralized traffic control and automatic block signals which you refer to are on the Cotton Belt track, are they not? Where are the C. T. C. and the A. B. S. signals that you have mentioned in answer to Mr. Light's question located? A. On the Cotton Belt track.

Q. What is movement over the Rock Island track governed by? A. Train orders and time table.

Q. This track is not equipped with C. T. C. nor A. B. S. signals? A. No, it is not.

Q. Mr. Hall, in answer to one of Mr. Light's questions you said that one of the things that the brakemen are not trained to do that the firemen perform was starting the locomotive engine. Is this the only thing or is this the only duty that the fireman performs that the brakemen are not trained to perform? A. No. There is many, many other things.

Q. Are these concerned with the operation of and corrections of malfunctions on the locomotive consist?

Mr. Light: I object to the leading nature of the question.

By Mr. Ross: Q. What type of duties generally are the brakemen not qualified from experience or by training to perform that the fireman does perform? A. Correcting all malfunctions on the engine.

Q. Have you ever seen a brakeman operate an engine? A. Not actually operate it, no, sir.

* * * *

Recross-Examination.

By Mr. Light:

Q. Do I correctly understand it to be your testimony that a fireman is qualified to correct all malfunctions on the engine? A. No, sir. There is some malfunctions

that you couldn't or at least I most likely couldn't correct, some.

Q. Does the fireman have any tools issued to him to work on this locomotive? A. The fireman usually carries a screw driver and a little wrench and if necessary he will correct a malfunction with that but most malfunctions you don't need a wrench. It is just checking out something or checking a fuse, finding some relay that is out or in or opposite from what it is supposed to be.

Q. Most malfunctions that can be correct on the road require changing a fuse or pushing a button, don't they? A. No, there are some that don't.

Q. The railroad company does not issue to the fireman a screw driver or a wrench, does it? A. No, sir, they don't issue the fireman that but we have been told that we should carry them by the officers of the company and Mr. Rich there is one that has suggested we carry those wrenches, tools to do that stuff with.

Q. Mr. Rich's instruction in that regard pertain to making the air connections, did they not? A. No, sir, you wouldn't need a screw driver and a small wrench for that.

Q. What does a fireman do with a screw driver and a small wrench? A. Well, you can get into contactors and you can get into the governor on an Alco engine and there is numerous things that has covers over them with screws. For instance, the cooling fan relays. You have to have a wrench to get to those.

Q. What training does the fireman receive to qualify them to work on these diesel locomotives, to do mechanical work on them? A. The railroad company furnishes us manuals and we have instruction classes where the road foremen come down and talk to us and then if we run into trouble, we call him and he tells us what to do, why, we go out and buy an electric welder to start engines, request from the master mechanic and road fore-

man and he instructs us to do this stuff when we call him if we haven't already found it before we call him.

Q. You all get out on the road and break down and there is some mechanical difficulty you can't correct, you get Mr. Rich on the phone and find out what to do, don't you? A. If it cannot be corrected by us and maybe we would know what to do but you have to have authority on some of that stuff before you can do it. In other words, before you use a higher amp fuse than one that is supposed to be, you have to get the authority for it.

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INTERVENORS' EXHIBIT NO. 3—
Testimony of Harold Rhoads.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 3—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 4—
Testimony of Bobby James Franklin.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 4—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 5—
Testimony of L. T. Walker.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 5—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 6—
Testimony of P. F. Thompson.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 6—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 7—
Testimony of G. H. Rouse.

My name is G. H. Rouse and I live at 1103 North Tucker, Pittsburg, Kansas. I am employed by the Kansas City Southern Railway Company and have been so employed for twenty-five years as of last September. I have been a qualified fireman for the last twenty-four years and for the last four of those years I have been a qualified engineer. I am presently working as a hostler in Pittsburg, Kansas. I became a qualified fireman by making standard trips and by passing a series of tests. One of the tests was an 800 question test as to the operating rules and regulations and the movement of trains and execution of train orders. These tests include extensive questions on the mechanical operation of the motive power and the general execution of duties of firemen in connection therewith. Every two years we are subject to re-examination on rules and regulations.

Most of my time with the Kansas City Southern Railway Company I have worked in the First District of the Southern Division and the Second District of the Southern Division. I worked in the First District from Kansas City south to Pittsburg, Kansas. I worked in the Second District from Pittsburg, Kansas through Missouri and through the northwest corner of Arkansas to Watts, Oklahoma. The last time that I worked on the Second District, which includes the line through Sulphur Springs,

Gravette, Decatur, Gentry and Siloam Springs, Arkansas, was about five months ago and I was on that run for a period of about eight months. I am familiar with the operation of the Kansas City Southern Railway Company in the State of Arkansas in the Second District which is in the northwest corner of the state from the Missouri line just south of Noel, Missouri to the Oklahoma line which is just west of Siloam Springs, Arkansas. This is the only part of Arkansas in which I have worked.

When going south on this run, I would board the train at my home terminal of Pittsburg, Kansas and work through to Watts, Oklahoma. We would enter Arkansas at approximately mile post 202 and leave Arkansas at approximately mile post 233, for a total track mileage in Arkansas of approximately 31 miles. On the return trip I would board the train at Watts, Oklahoma and work through to Pittsburg, Kansas.

The trackage in Arkansas is over very mountainous terrain with many steep inclines, declines and curves to negotiate. Movement over this track is governed by automatic block signals, train orders and time table.

At Sulphur Springs, Arkansas, there are three crossings —railroad with highway—with one of the crossings being protected by a bell and flashing lights and the other two crossings are unprotected. At Gravette, Arkansas, there are four crossings, all protected by bell and flashing lights. At Gentry, Arkansas, there are two crossings protected by bell and flashing lights, and one crossing which is unprotected. There are four crossings at Siloam Springs, all of which are protected by bell and flashing signals. This 31 miles of track in Arkansas is equipped with automatic block signals and movement of trains over this track is governed by time table, train order and automatic block signals. This is a single main line track except for double main line track at Gravette for approximately 133 car lengths or one and one-third miles. There

are two through freights each day going south over this track and two through freights each day going north. There are also two passenger trains each way over this track each day, plus a local train which travels south one day and comes back north the next day. During the eight months that I was operating in through freight service over this track, the through freights would average 125 cars each and would be pulled by five units, usually of the GP30 model.

The track at Gravette is on an extreme incline in both directions. The middle of the hill is right in front of the depot. Any cars that are switched have to be tied down with hand brakes and if a car got loose, it would go at least six miles crossing at least ten unprotected highway crossings used by pedestrians and motorists and there have been several cars in the past years that got away causing damage to equipment. On approaching Gravette from the north we have had numerous break-in-twos. I would say that during the eight months I was operating in this district if we made two out of three trips without having a break-in-two, we were lucky.

When a break-in-two occurs, of course, the train stops. The head brakeman and the swing brakeman, both of whom are riding on the rear engine unit, walk back toward the middle of the train to ascertain where the trouble is. The conductor will leave the caboose and walk forward toward the middle of the train to determine the cause of the trouble. The conductor is in charge of the train and determines what action is to be taken. The rear brakeman will remain in the caboose or at the rear end of the train to protect it. At times it is necessary for the rear brakeman to proceed back beyond the rear of the train for flagging purposes. When it is necessary to flag ahead of the train, the fireman will move ahead of the train for that purpose. On a tonnage train, that is, a train on which the engines are pulling the maximum ton-

nage according to the total tonnage rating of all engines, it is impossible to start a train on an incline as steep as the one at Gravette. In this situation the train will have to be doubled, that is, part of the train will be pulled to the next passing track and left there while the engines return to pull the remainder of the train ahead for reconnecting to the train.

The break-in-twos are caused by either breakage of a knuckle or breakage of a draw bar. If the break-in-two is caused by a broken draw bar, the draw bar cannot be replaced by the train crew. In replacing a broken knuckle the spare knuckle must be obtained from the caboose or from the engine consist. Knuckles weigh approximately 80 to 90 pounds and it takes two men to carry them and two men to place the knuckles to install it on the car. Broken knuckles usually occur to the rear of the middle of the train and because of the number of cars, the brakemen will have to spread out to pass signals for movements to the engine crew. Oftentimes the fireman will have to leave the cab of the engine in order to see the brakeman and pass signals to the engineer.

If a drawbar is pulled or broken, then the car affected must be set out. If the drawbar pulled is on the rear of a car then the car will be pulled to the next siding or town and set out. Because of the large number of cars and the curvature of the track it is necessary for every member of the train crew and oftentimes the fireman to spread out to pass signals for the safe movement of the train. If the drawbar is pulled from the head end of a car, then the cars in front of that car are pulled to the next siding and the engines return to the affected car, the car is chained to the engines, pulled to the next siding, set out and the engines return for the balance of the train. At these times every member of the crew is performing a duty which is essential to the safe movement of the train.

It is impossible to see the full length of the train at this location because of the curvature of the track. The next passing track is at Gentry and when the train is doubled over, the front end must be taken to Gentry and left while the engines return for the rear of the train. Because of the curvature of the track on this hill p-proaching Gravette, it is necessary on the doubling operations for the train crew to be spread out in order to pass signals authorizing the engine crew to move the train.

I have operated as a fireman on a hand fired steam engine. Although on the hand fired steam engine a great deal of my time would be spent shoveling coal into the fire box to provide steam for the operation of the locomotive, I was familiar with the area over which the train ran and I would arrange my stoking operation so that I would be available almost 100% of the time to perform my lookout duties at crossings, dangerous curves, or while passing through towns and at any other time when we were approaching a dangerous or potentially dangerous situation. On the coal burning steam engines equipped with stokers, I would be available approximately 95% of the time to perform the lookout function. The same is true on the oil fired steam locomotives. It was rarely necessary for the fireman to leave his position of lookout in the engine compartment.

When I first came to the Kansas City Southern Railway Company, one of the biggest trains I was on over this Arkansas territory was approximately 3000 tons capacity. This train was pulled by two steam engines coupled together and it was necessary to have an engineer and fireman on each of these locomotives for an engine crew of a total of four. Today we pull 8000 tons or more of freight on this run with an engine crew of one fireman and one engineer and we are usually operating a multi-engine consist of five locomotives.

Among the duties of the fireman before leaving the ter-

minal is to check each engine of the engine consist to see that each engine has lights, fuel, water and sand. The fireman is responsible for seeing that the head end or engine consist is equipped with red flags, fusees, torpedoes, extra fuses, spare knuckle, extra air hoses, extra jumper cables, chains in order to move cars if necessary, and drinking water.

The fireman must see that all units of the engine consist are properly connected and the control set for multi-engine operation. The engineer and fireman together must make an independent brake test of the engine consist to see that the brakes are properly setting and releasing properly. In order to perform this test the engineer must be at the controls inside the engine and the fireman must be on the ground. The engineer will set the brakes and the fireman will inspect to see that all brakes are set. The engineer will then release the engine independent brakes and the fireman inspects to see that the brakes are releasing properly on all engine units. Upon leaving the terminal, the fireman must ascertain that all units are loading properly and making proper transition. This inspection can only be made while the engines are under power and the train in motion.

It is my opinion from my personal experience as a fireman for 24 years and as a qualified engineer for the last 4 of those years that the presence of the fireman contributes to the safety of the train crew and to the general public. Other than the engineer, the fireman is the only qualified engine man on the train. He is the only man who can relieve the engineer or perform work on the locomotives. The fireman provides the engineer with an additional pair of eyes, ears and hands, for the safe operation of this train. In addition to that, the fireman provides knowledgeable and experienced assistance to the engineer in the performance of his duties.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 7—
Cross-Examination,

By Mr. Light:

Q. State your name, please sir? A. George Rouse.

Q. What is your union affiliation? A. Brotherhood of Locomotive Firemen and Enginemen.

Q. Do you hold an official position with that organization? A. I am Local Chairman.

Q. You live at Pittsburg, Kansas? A. Yes, sir.

Q. Are you still working as a hostler at Pittsburg? A. Yes, sir.

Q. You have described in your testimony a run between Watts, Oklahoma, and Pittsburg, Kansas, that you made for a period of about eight months up to some time last summer. Is that correct? A. Yes, sir.

Q. Were you in both local and through freight service over that run during that period of eight months? A. Well, we did local work but I was assigned regularly to through freight service.

Q. You mean the through freight train on which you worked made pick-ups and set-outs at some points along the way? A. Yes, sir.

Q. On each run or just on some of the runs? A. On practically every run.

Q. Would that usually be one pick-up or set-out or more for each run? A. Well, on a morning train it was usually Neosho was the only place we would set out but of a night and on week ends when the local had already gone, we would set-out and pick-up at any designated point. At Anderson, we have picked up cars of chickens and at Gravette we have set out seed, Gentry we have set out seed and we have picked up cars and set-out, picked up chickens at Siloam Springs.

Q. What was your average time on duty on this run between Pittsburg and Watts? A. Well, one month we kept track and it was about six hours and forty minutes.

Q. What month was that? A. That was in December of last year.

Q. Would that be December of 1965? A. 1966.

Q. Were you still on this Pittsburg to Watts run? A. No, sir.

Q. In December of 1966? A. No, sir, I was not.

Q. How did you participate in keeping records on that run at the time you were not on it? A. Well, I had a lot of slips to show and I asked each man to make out a daily slip each day to show how many hours he had worked and how many hours off duty and the total time on duty.

Q. Now, you helped prepare this set of statistics for the Pittsburg to Watts assignment at a time when you were working as hostler? A. Yes, sir.

Q. At Pittsburg? A. Yes, sir.

Q. I take it you did that in connection with this lawsuit. Is that right? A. Yes, sir.

Q. Do you think your time on duty when you were working on that run averaged somewhere near six hours and forty minutes? A. At the time that I was on that run, we were doing a lot of aggregating and we were on duty a lot more than that because it was during the wheat rush.

Q. I have here the time slip for August 19, 1966, between Pittsburg and Watts on which train you were fireman and it indicates the total time on duty to be four hours and thirty minutes. Do you think that is probably right? A. Yeah.

Q. For that day? A. Yeah.

Q. And I have another slip here for August 25 between Pittsburg and Watts and the total time on duty as indicated is four hours and ten minutes. Do you think that is right? A. I would say that is an extreme.

Q. That is about as short a time as you would ever run it. Is that right? A. Right.

Q. This is one hundred and nine miles between these two terminals? A. Yes.

Q. And there is a segment of thirty-one miles of that in Arkansas? A. Yes, sir.

Q. Is that correct? A. Yes, sir.

Q. What size crew served with you on that through freight when you had that assignment? A. Well, it was a full crew which would consist of three brakemen, a conductor, engineer and fireman.

Q. A six man crew? A. Yes, sir.

Q. What size crews are operating the through freight trains out of Pittsburg in the other directions? A. It would be a five man crew.

Q. Would some of them be four man crews? A. Yes, north out of Pittsburg would be.

Q. What is the difference of the trains that operate north out of Pittsburg with four man crews and those that operated south with six man crews? A. Well, the physical characteristics of the railroad would enter into the size of your trains and whether you would be able to see your train.

Q. Did they operate shorter trains north out of Pittsburg? A. No, sir.

Q. Last summer than they did south? A. No, sir.

Q. Did they operate longer trains north of Pittsburg? A. Yes, sir.

Q. Longer trains with a smaller crew? A. Yes, sir.

Q. It is not any secret, is it, Mr. Rouse, that the reason they operated out of Pittsburg south with six men was because of the Arkansas Statute? A. Well——

Mr. Ross: I object to that on the grounds that it calls for a legal conclusion.

Mr. Light: Let me rephrase it to make sure that it doesn't.

Q. Do you know, Mr. Rouse, why the trains operated south out of Pittsburg had six men on them and the ones operated north just had four? A. I guess that's the law.

Q. You indicate on Page 2 that the trackage in Arkansas, this thirty-one mile segment is very mountainous terrain with many steep inclines and declines and curves to negotiate? A. Yes, sir.

Q. Is that correct? A. Yes, sir.

Q. Now, how about the trackage on that run in Missouri? A. North?

Q. Between—— A. Pittsburg.

Q. Pittsburg and the Arkansas line? A. Well, between Pittsburg and Neosho, Missouri, we don't have any inclines or grades of over one half of one percent.

Q. How about from Neosho to the Missouri line? A. We have one grade.

Q. What percent? A. Well, it would run up one and three quarters percent.

Q. What is your steepest grade in Arkansas? A. It would be two percent.

Q. Do you know what the controlling grade is on your railroad? A. What do you mean "the controlled grade" by the tonnage?

Q. No, sir, I mean the most acute or greatest grade there is on the K. C. S.? A. Well, I understand two percent.

Q. Do you know where it is? A. Probably Rich Mountain.

Q. How about the territory after you leave Arkansas going south on to Watts with reference to the terrain? A. It is down hill.

Q. Is it mountainous? A. Yes, sir, but it is down hill to Watts and then it is level, pretty level on to Heavener, what I mean, little hog-backs.

Q. You are in pretty hilly territory from the southern part of Missouri on down to Watts, aren't you? A. Yes, sir.

Q. This entire run from Pittsburg to Watts is A. B. S. territory? A. No, sir.

Q. What part is not? A. From Gentry, Arkansas to Watts is centralized traffic control.

Q. And the balance of it is A. B. S.? A. Yes, sir.

Q. You mention that at Gravette, Arkansas there have been several cars in the past that have gotten loose on inclines and caused damage. Were you present when any of those incidents occurred? A. No, sir, I wasn't.

Q. Where did you get that information? A. From the crews that worked there and I have seen cars that had been damaged there when we were going through there.

Q. Are there other switching points on your railroad that you are familiar with that are on inclines other than Gravette? A. Yes, sir.

Q. Are some of them in States other than Arkansas? A. No, sir.

Q. Arkansas is the only State over which your railroad operates that has inclines at switching points, places where switching operations are conducted? A. It's the only yard that has extreme inclines where the use of extra men would be necessary to the best of my knowledge to protect the people as well as the merchandise.

Q. At the other places on your railroad where switching operations are conducted, it is sufficiently level that a four man crew can safely handle the operation? A. Well, no, I wouldn't say that it was. The curvature of the track would make it to where another man would have to take the fireman's place in order to be able to see signals. It would be absolutely impossible to pass signals.

Q. Then, you do have places on your railroad where switching operations are conducted outside of Arkansas that the curvature of the track makes it impossible for a four man crew to conduct switching operations? A. Without a big delay or a complete disregard for safety.

Q. You indicate at the top of Page 5 that frequently the fireman will have to leave the cab in order to see the brakeman and pass signals on to the engineer. This is correct, isn't it? A. I have did this.

Q. That doesn't violate any company rule or rule of good railroad safe practice to your knowledge, does it, Mr. Rouse? A. No, sir. In addition to the absence of a brakeman for the safe movement of your train, the fireman is supposed to assist the brakemen.

Q. You describe on Page 5 what's done when a drawbar is pulled in order to correct that situation and say "At these times every member of the crew is performing a duty which is essential to the safe movement of the train." Now, I take it you mean all six members of the crew, is that right? A. Yes, sir.

Q. Now, when you pull a drawbar up in Kansas or Oklahoma or Missouri, how do the four men that operate the train handle that situation? A. Well, we have taken as long as two hours to set out a drawbar on the first district because we couldn't see signals and wait until they got over there.

Q. That was on a train crew consisting of how many men? A. Four men.

Q. It took you a little longer? A. Yes, sir.

Q. You didn't injure anybody in the process, did you? A. No, sir, not when I was on the crew, no, sir.

Q. You have related at the top of page 6 your experience on a hand fired steam locomotive and indicated, if I have correctly read it, that you were available for your lookout function one hundred percent of the time when you were entering congested areas or dangerous situations where a lookout was particularly needed. Have I fairly stated the substance? A. Yes, sir.

Q. Of what your testimony is on that? A. Yes, sir.

Q. How long could you leave your duties of tending the fire and go perform your lookout function before you would have to return to your duties to tend the fire? A. Well, it would be the type and the condition, times of your train and the fires of your engine and the quality of coal you were firing with and if you had enough warning ahead of time to prepare for an occasion like this.

Q. What sort of warning would you get? A. Well, if you knew you were going to stop and set-out at an ascending or descending grade such as Gravette or Decatur, you would get down where you weren't passing over road crossings approaching this and maybe throw in as high as fifty shovels of coal and that would last you for fifteen or twenty minutes after you stopped and you could hold your steam back at that time with water, leave your water a little low so you could keep your steam up and increase your water, get ready to leave there.

Q. Did you hand fire a locomotive over this run from Pittsburg to Watts? A. Yes, sir.

Q. Wasn't a fireman a pretty busy man with the grades on this run? A. We figured actual time consumed firing was between forty-two and forty-five percent.

Q. And the rest of it was just sitting in the seat looking out? A. Well, yes, you might say that.

Q. Well, would you say that? A. Yes, I would say that.

Q. When you fired on a stoker fed coal burning steam locomotive, how much of your time was available to keep a lookout? A. Well, it would be at any time you needed to because those stokers were automatic and it would be hard to define exactly how much time you spent looking at the gauge because you would glance at it.

Q. Was there anybody else in the locomotive with you on these steam engines other than the engineer? A. Yes, sir, a brakeman.

Q. The head brakeman rode on the steam locomotive too? A. Yes, sir.

Q. Did he have any duties in connection with the lookout? A. Oh, yes, sir.

Q. While you were down shoveling coal, wasn't he looking on the left hand side and keeping a lookout there? A. Well, it would be according to the curvature of the track. He wouldn't look back on the outside of a curve. He would look back on the inside so that he could see the train.

Q. In other words, he would move from one side of the cab to the other depending on the curve? A. Yes, sir, and there was a seat on both sides of the cab of a big engine so that he could do that.

Q. How would you compare the view that you had as fireman to the front on a steam locomotive to the one you have on the diesel locomotives you operate now? A. You mean the visibility of the terrain?

Q. The visibility of the terrain ahead of the train? A. Ahead of the train?

Q. Yes, sir. A. Well, I couldn't define it in a percentage as far as that is concerned but it is a better view.

Q. You have got a bigger glass area, haven't you? A. Yes, sir.

Q. And, of course, you don't have a big long steam boiler sticking out in front of you now, do you? A. That's right.

Q. Was it your experience on a steam locomotive that the smoke sometimes obscured your vision forward of the train? A. Well, very little.

Q. The smoke didn't tend to blow back from the stack towards the cab? A. No, sir. In road service the smoke would come out of the smoke stack with enough force that it would go high enough it would go right on back and if a locomotive were firing properly, you had no black smoke.

Q. Is that a factor that the fireman was required to make an observation on at frequent intervals, that is, the color of the smoke coming from his stack? A. Yes, sir.

Q. It was pretty important to the fireman, wasn't it? A. That's right.

Q. Did you ever work on a locomotive where a light was mounted up there near the stack so that you could see the color of the smoke? A. Every locomotive we had had that. That would be improper combustion, in fact, if you got too much black smoke.

Q. Would you say that more of your lookout activities

as a fireman on a steam locomotive was devoted towards looking at that smoke or looking at the track ahead? A. Well, looking at the track ahead.

Q. How frequently would you check the color of the smoke? A. About the same as we look back to see the color of our diesel engines to see if we have got a piston busted or unusual smoke pouring out indicating motor trouble.

Q. You say on page 6 that "with oil fired steam locomotives, it was rarely necessary for the fireman to leave his position of lookout in the engine compartment." Is that true, Mr. Rouse? A. Yes, sir.

Q. Is that likewise true with diesel locomotives? A. No, sir.

Q. You mean the fireman's job is more demanding with the diesel than it was with the oil fired steam locomotive? A. Yes, sir. I would rather fire an oil fired engine than I would a diesel locomotive with multiple units.

Q. What do you mean by "firing a diesel locomotive"? A. By attending to all of the duties in the engine room that we are assigned by a railroad company to perform.

Q. There is not any fire on a diesel locomotive for you to attend, is there? A. What?

Q. There is not any fire on a diesel locomotive for you to tend? A. The duties of a fireman on a diesel locomotive have been defined and assigned to us as checking each engine in a multiple unit.

Q. Where does that appear in your railroad's publication of instructions? A. When we first got our diesel locomotives on the Kansas City Southern Railroad, they put an instructor on and held classes.

Q. I might ask you to answer my question now. I asked you where in the publications of Kansas City-Southern Railroad Company there is listed or defined duties of the fireman in connection with the diesel motor fire power? A. In the book of rules the fireman's duties is defined but I don't believe the word "diesel" is mentioned.

Q. This is a publication that was put out by the company in steam locomotive days, isn't it? A. Yes, sir.

Q. And the testing that you have gone through to become an engineer, they have tested you on the operation of steam locomotives, didn't it? A. No, sir, nothing on steam locomotives.

Q. When were you promoted to engineer? A. 1963. I'll look and be sure if you want me to be sure. (The witness removed his wallet from his pocket and looked at some cards.)

Q. On Page 7 you indicate that the engineer and fireman together must make the independent brake test? A. Yes, sir.

Q. Isn't it true, Mr. Rouse, that the engineer can make that by himself by setting the brakes and then getting off? A. If he wanted to spend about an hour doing it.

Q. Would it really take an hour? A. Well, if he had any trouble in any way, he would have to walk it about four times to get a proper Government air brake test on it.

Q. Well, if he didn't have any trouble, how long would it take the engineer to make the test by himself? A. Oh, about fifteen minutes.

Q. And, of course, the engineer could make that test with the assistance of any other member of the train crew, couldn't he? A. Yes, if they would instruct the brakeman what to look for and train them to take the fireman's job.

Q. In about the middle of Page 7 you say "Upon leaving the terminal, the fireman must ascertain that all units are loaded properly and making proper transition." Why must the fireman do that? A. I have been instructed by the supervisors of the railroad to do this and we have traveling engineers, diesel supervisors and we are required to make out a government report on our entering our final terminal stating any malfunctions or repairs needed on these locomotives.

Q. You are a qualified engineer, Mr. Rouse. When you are operating a locomotive leaving a terminal, can't you tell from your position in the engineer's seat whether your units are loading properly? A. Under no condition would I be in authority to tell you that I could tell if I was loading properly or not until I got the feel of the train or knew the feel of the train and it is very possible I would get down to where I had to have all of the power and wouldn't have it.

Q. Do you have a fireman helping you in your work as a hostler in Pittsburg? A. Yes, sir.

Q. I don't know very much about a hostler's work. Tell me just briefly what you do? A. A hostler takes the engines from a crew on the completion of their trip and spots each sandbox for the laborers to fill with sand, spots it for fuel and will put it in the house in the prescribed place so that they can put oil or change brake shoes or get under the ramp and inspect the traction motors and to cut the engines and switch them and make up the consist of the train. We cut an engine out if it is not performing properly and spot it on the turntable so they can drop the wheels and it has to be done exactly right because they have anchors that come out to support the engine that can't be a half inch either way and some of these engines weigh two hundred and five pounds and they have to be spotted right.

Q. A hostler's work is largely moving light engines around within the terminals, isn't that correct? A. Yes, sir.

Q. Are all of the crews of hostlers at the Pittsburg terminal made up an engineer and fireman? A. No, two firemen.

Q. An engineer and two firemen? A. No, sir.

Q. All right, tell me what it is? A. Two firemen.

Q. All of the hostler operations at Pittsburg consist of crews of two firemen? A. Yes, sir, a hostler and a hostler

helper which comes out of the ranks of the firemen. We test engines and load them and check them so that they can be checked for proper operation is another one of our duties.

* * * *

Redirect Examination,

By Mr. Ross:,

Q. Mr. Rouse, this book of rules that you referred to is still in effect, is it not? A. Yes, sir.

Q. And train and engine crews are subject to discipline for failure to abide by these rules? A. Yes, sir.

* * * *

INTERVENORS' EXHIBIT NO. 8—
Testimony of W. H. Thompson.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 8—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS EXHIBIT NO. 9—
Testimony of J. F. Cross.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 9—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 10—
Testimony of Oscar L. Blasingame.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 10—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 11—
Testimony of Elwood Daffron.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 11—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 12—
Testimony of Arthur C. Boyd.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 12—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 13—
Testimony of Glenn F. Briley.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 13—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 14—
Testimony of J. L. Coleman.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 14—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 15—
Testimony of Marvin Page.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 15—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 16—
Testimony of W. D. Moses.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 16—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 17—
Testimony of Earl T. Paul.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 17—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 18—
Testimony of J. W. Chrisman.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 18—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 19—
Testimony of W. E. Pearsall.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 19—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 20—
Testimony of Irving Newcomb.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 20—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 21—
Testimony of C. T. Watts.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 21—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 22—**Testimony of Wendell Chesshir.**

My name is Wendell Chesshir and I am employed by the Missouri Pacific Railroad Company. I went to work for the MoPac on May 28, 1959, as a brakeman. I was promoted to conductor in October of 1964. I presently work the territory between North Little Rock and Texarkana in freight service and between North Little Rock and Poplar Bluff in passenger service. I am not regularly assigned on any particular run. I am working the extra board.

I am familiar with and have worked an average of once a week on the local freight between North Little Rock and Texarkana. This local freight is referred to the Long Barrel Local because of the long distance that it covers. The distance from North Little Rock to Texarkana is 147 miles.

There are actually two trains referred to as the Long Barrel Local, one operating each way each day between North Little Rock and Texarkana.

I work as a brakeman on the Long Barrel Local in any one of the three positions. The positions of the brakemen are determined by the conductor. If the conductor lets the men choose the position in which he wishes to operate, this is done according to seniority.

When this crew goes to work, the head brakeman will check his watch with the standard clock and obtain the train orders for the engine crew. The rear brakeman and head brakeman ride the engine units back into the 100 Yard where the train is made up. Those rails in the 100 Yard only hold 60 to 65 cars. We almost always have at least one double and sometimes two doubles to pick up our train. The car consist on this Long Barrel Local will be anywhere from 60 to 130.

After coupling the engine units on the head end of the

train, the head brakeman procures permission from the yard master to double and pick up the remainder of the cars for the train. The rear brakeman is checking hand brakes on the end of this cut that we pick up first. When permission is obtained from the yard master to start the move, the head brakeman rides down in the curve to the left and relays signals from the rear brakeman to the engineer. When the engine gets over the switch with the cars, the head brakeman lines it back to the rail where the rest of the train is to be picked up. Of course, if there is another double, he repeats the same moves. When all the train is coupled on the head brakeman goes back to the lead unit of the engine consist and the rear brakeman goes to the caboose, checking hand brakes and retainer valves on the cars and when he gets to the caboose, he cleans it, sweeps it out, builds a fire and lights the markers. Some of the cabooses are equipped with electrical markers and some with kerosene markers. These markers are lights with green and red lens and are hung outside the caboose with the red lens to the rear and the green to the side and front. The rear man will also secure drinking water for the caboose.

From here the train moves to the Locust Street yard office where it picks up the swingman and the conductor who have been checking the waybills against the wheel report and making a list for the swingman who is then instructed by the conductor on the switching to be done. The swingman in turn gets on the lead engine unit instructing the engineer and head brakeman what the conductor's wishes are. The conductor will, when he gets on the caboose, report key instructions to the rear brakeman as to how to perform the switching.

Our first stop will be Cash Wholesale. If we have more than 100 cars, we have to cut our train at the Geyer Springs Crossing. This crossing is protected by automatic gates. Since our train is still occupying the circuit after

the train is cut, the conductor with his switch key, keys the gates so they will rise and stay up. The swingman makes the cut and the engine crew and the head brakeman and the swingman proceed to Cash Wholesale and Enmar No. 1, a distance of about two miles.

In leaving the main line going onto the spur track which leads to Enmar, Inc. No. 1 and Cash Wholesale, the head man will throw the switch onto the spur track. Swingman will remove the derail from the track and our engine will be backing, shoving cars onto the spur and then from the spur onto the Enmar, Inc. track. The Enmar track is on a curve and it takes both brakemen to spread out to pass signals. After Enmar, we come back out of the spur, shove on towards Cash Wholesale, crossing Forbing Road which has to be flagged, on back to the Cash Wholesale track. There is an "S" curve in this track and work often has to be done on the fireman's side in shoving back to spot at Cash Wholesale. After completing the work here, we return to the main line, back down the main line to the Geyer Springs Road where the rearman has come up from the caboose to flag the crossing and couple the train.

After we pick up our train here we proceed to AP&L spur track. We leave our train on the main track with the conductor in the caboose. The engine then backs shoving cars onto the AP&L spur with the head brakeman lining the switch from the main line, the swingman removing the derail and the rear brakeman opening the gate crossing the track. The three brakemen then spread themselves out on the sides of the cars in order to pass signals as this track is an "S" curve. There are also three other gates which have to be opened and sometimes a fourth if the train goes all the way to the AP&L plant. Just beyond the second gate is a county road which is unprotected. The rearman opens the second gate and flags the crossing and the swingman crosses the road and

opens the third gate. We usually set out our cars between the third and the fourth gates on this track.

After moving out of the AP&L spur track, we move a short distance down the main line to Enmar No. 2 plant. Just beyond the spur track leading to Enmar is an unprotected public crossing which our engines occupy before making the shove. This crossing is protected by the head brakeman who remains at this crossing to flag it again when the engine pulls the pickup cars out of Enmar and again when the engine comes out of Enmar the last time. The swingman will throw the switch for the main line and the rearman will move the derail. The swingman will position himself at the crest of the curve in order to pass signals to the engineer and the rearman will spot the cars at Enmar and make the cut and secure the handbrakes on those cars. This same movement is made twice because first we have to pull out cars and then go back into Enmar to leave the cars there. The headman stays on the crossing to flag as the engine moves over that crossing each time.

After coming back out of Enmar, we back up and couple onto the rest of the train. Before coupling onto the rest of the train, we couple the air brakes on the cars that we've picked up, make an air brake test, and then couple onto the train.

The next stop is Bryant, Arkansas. In switching Bryant, the train will be cut behind the cut of cars to be left at Bryant. Some four to eight cars will usually be left there. However, the cars that have been picked up at the previous switching points will be ahead of the cars to be set out at Bryant so the engine will have hold of from eight to fifteen cars usually. Because of the length of the train, in doing this switching the engine will probably stay on the main line. The engine will be in the curve of the main line, therefore it makes its backing or shoving movement on the Bryant tracks from the

main line. Because of the curves, signals will be given on the fireman's side. The head brakeman must stand in the curve to the east of the main line track in order to pass signals to the engine crew. The cut of cars will be shoved off the main line to the west. Either the swingman or the rearman has proceeded to the Mill White Plant to secure switching instructions. The other brakeman will throw the switch from the main line and relay signals.

After leaving the main line, the track operates into two spur tracks—one to the Mill White plant and one to two other spots. There will be cars to be picked up and set out on each of these spur tracks necessitating two movements on each track. Both tracks are curved making it necessary for the brakemen to scatter out to pass signals to the head brakeman who in turn passes the signal to the engine crew. There are also obstructions and close clearances on both rails which make it necessary that all three brakemen be used for passing signals. The conductor has remained with the train on the main track. He is in the caboose doing his paper work, making out his wheel report, switch list, and handle report. At this time the caboose is anywhere from half a mile to a mile and a quarter from the head end because of the length of the train. If we had to wait at each switching point until the man riding in the caboose walked up to the head end to help with the switching, we would never make it to Texarkana within the 16 hours which is the maximum number of consecutive hours under federal law that we can work.

After switching Bryant, we take our cars back to the main line where the brake test is made, then couple on to the main train. The swingman will then call the conductor by radio if the radio is working and inform him of the numbers on the cars that have been picked up at Bryant. The conductor will then make a blind siding report of the cars on this siding and leave it at Benton.

We then proceed to Bauxite. Our train is on the west main line of the double main line track at Bauxite. The head brakeman calls the dispatcher and secures time and track to cross over to the east main line. We cross the east main line on to the passing track, proceed to the south end of the passing track. If we have more than 75 cars, which is all the passing track will accommodate from the south lead switch to the north lead switch, we must cut our train and double the remainder of the cars back on to Track No. 1. If this cut to be doubled contains as many as 35 cars, we must proceed out of the pass back onto the east main line, permission for which must have been obtained when the headman first contacted the dispatcher. After reaching the east main track, the east main track curves to the left which makes it necessary for the headman and the swingman to scatter out to pass signals while the rearman aligns the switch from the passing track to the Bauxite yard. This cut is then shoved into the Bauxite yard and the swingman must see that all switches are aligned for movement onto Track No. 1. There are seven switches on this lead track which the rearman must line up for our movement.

After this cut of cars is left on Track No. 1, we must pick up the cars for Gum Springs. These cars will be in Track 4, 5, or 6 and sometimes in all three of these tracks. In order to pick up these cars, we have to move other cars off those tracks. There will usually be several different cuts of cars on these tracks and those cars have to be coupled together and pulled off the track in order for us to reach in and pick up the cars for Gum Springs. Cars for Gum Springs may be scattered throughout these three tracks making it necessary to make several moves in clearing those tracks and picking up the cars. In making these moves at times we will have hold of enough cars to make it necessary to again pull onto the east main line track for which we have to secure

permission from the dispatcher and as we are again moving on the curve of the main track, brakemen have to spread out in order to pass signals. The switches from the lead track to the numbered tracks must be aligned for our movement each time we make a move. All these tracks are on an incline to the north and air must be coupled on any cut of cars to be moved and the hand brakes set and left on cars set out and hand brakes released on cars moved.

After building our cut of cars for Gum Springs in this fashion, we must move back to Track 1, couple onto the part of our train left there, and again proceed on the east main line which is curved and again it is necessary for all members of the crew to space themselves in order to pass signals to the engine crew. The train is backed to the passing track to pick up the remainder of the train. In order to couple onto the train, each member of the train crew is spaced so that signals may be passed to the engine crew in order to safely make this connection. We then proceed on the east main track to Benton.

While we are doing the switching at Bauxite, the conductor has obtained the waybills on the Gum Spring cars from the depot and has wheeled those cars on his wheel report and made a switch list for Gum Springs. We make our brake test on the cars picked up at Bauxite and the conductor is on the caboose and the rearman who has made the joint with our main train on the passing track may ride a nearby car, if there is a flat car or pulpwood rack car close by, or if he has time he will walk to the head end and get on one of the engines.

We then move on to Benton where we will switch for approximately three hours. We approach Benton on the east main line track. We cross an unprotected crossing and pull down to the Bauxite and Sheridan Highway. The track between the unprotected crossing and the

Bauxite-Sheridan Highway will accommodate approximately 70 to 80 cars and if we have more than 70 to 80 cars, the rear of our train must be cut short of the unprotected crossing so as to leave it clear. The rearman will make this cut. The swingman will then make the cut at the Bauxite-Sheridan Highway crossing in order to leave that crossing clear. The head man calls the dispatcher to get track and time to clear the east main track over the west main track and into the old Hot Springs main track which goes to the Benton yard. The conductor will be in the caboose which may be as many as 40 cars to the rear of the first unprotected crossing and more than 130 cars from the head end of the train, or in other words, as much as 1⅓ miles from the head end. After the rearman makes a cut at the first unprotected crossing, he will walk ahead to the Arkansas Face Veneer Company which is about a quarter of a mile south of the Bauxite-Sheridan Highway or about a mile walk for the rear brakeman. The swingman will catch onto the lead cut of cars after cutting the Bauxite-Sheridan Highway crossing. The train will proceed onto the old Hot Springs main track across an unprotected city street, proceed on down in the vicinity of the depot. We will then shove cars which we have picked up en route and which are destined for Little Rock back onto the old house track or some other available track, cut these cars and set the hand brakes on them. We will proceed back to the Hot Springs main track, leaving the cars to be delivered to the Arkansas Face Veneer Company and then shove the remainder of our cars on another track, proceed back to the Hot Springs main line, pick up the cars for Arkansas Face, shove them back north on the Hot Springs main track, across the unprotected city street crossing which has to be flagged, and back onto the Arkansas Face Veneer Company Track. Where this track crosses the unprotected city street, there is a building with close clearances to the west of

the track and close clearances on the city street. One man stays at this crossing in order to pass signals because of the close clearance. Another man will position himself between the city street crossing and Arkansas Face Veneer Company in order to pass signals. By this time, the rear brakeman has walked approximately a mile from the first unprotected crossing on the main line and will be in a position to spot the cars at Arkansas Face. Of course we have to pull out any cars picked up at Arkansas Face back to the old Hot Springs main track before we can set out our cars at Arkansas Face. All three brakemen must be spaced so as to be able to pass signals to the engine crew. This is necessary because of the close clearances of the city street and the building adjacent thereto and to the track. We then proceed back to the vicinity of the depot.

We then couple onto the cut of cars that we have left in the Benton yard, plus any other cars which have been left by other trains for switching in Benton. We will proceed to the lead track to the south of the tracks on which the cuts of cars for Sheridan, Owasso Furniture, Hardboards, Inc., and Rock Island Interchange are built. There are six tracks off the lead track over which these cars may be assembled. There is an unprotected public crossing which must be protected during all of these movements. There is a switch to the south of this crossing about three feet. The head brakeman must operate this switch during these movements and flag the crossing. The swingman will operate the necessary switches and give signals while the rearman is at the track on to which the cars are kicked in order to stop a car by setting handbrakes or by seeing that that car couples onto the cars already in the track. We will then pick up the cars of the Rock Island Interchange on the rear end of the engines. The cut of cars for Owasso Furniture Company will be coupled to the headend of the engines so that we have cuts of cars on both the front end and

the rear of the engine. Air will be coupled and the test made. We will then move north back over the old Hot Springs main line with cuts of cars on each end of the engine, back across the unprotected city crossing which must be flagged, across the main line which in this instance must also be flagged, and track and time secured. We then move onto the east main line and move south down to the bridge signal so that the switch to the Rock Island Interchange can be unlocked. We have again moved over the unprotected crossing shoving cars which crossing must be flagged by the rear man.

The head brakeman is in the vicinity of the engine in order to pass signals to the engine crew. Swingman is at the switch to the Rock Island Interchange, or Sheridan Branch line as it is called. We will then proceed, shoving our cars to the Rock Island Interchange, set those out, pick up any to be brought back and on the way back, we will shove cars to Hardboard, Inc., and Owasso Furniture. These shoving moves are on curves and the three brakemen must space themselves in order to pass signals. The unprotected city crossing must again be flagged, gates to the Owasso Furniture Company opened, cars to be picked up there must be checked to see that no one is walking in or around the cars, cars picked up must be dragged back to the Sheridan Branch line or Rock Island Interchange and since we have cars on either end of the engine, the brakeman must again space themselves in order to pass signals and protect the crossings. The shoving move is again made to Owasso Furniture where cars are spotted. In shoving out of the Owasso Furniture Plant and back to the Sheridan Branch, we set out cars at Hardboard, Inc., which is located on this track.

Then we proceed back to the Sheridan Branch Line, back onto the east main line which again must be flagged, the switch has to be aligned to the main track and locked by the rear brakeman, the swingman flags the public

crossing, the headman is on the first locomotive in order to relay signals.

We then proceed back onto the old Hot Springs main line. There are other industries which must be switched involving situations in which each member of the crew is performing some necessary duty in order that the moves may be made safely. The Benton switching will often take as long as three hours.

The cars in our train are usually blocked at the Gravity Yard in North Little Rock according to stations or towns. By blocked, I mean that the cars destined for one station or town, such as Benton, will be together in the train without any other cars intermingled with them. However, these cars will be blocked only for the town and not for the industries in the town and not according to the order that those industries are switched. Therefore, out of the cars that are blocked for Benton, for instance, the cars destined for the Rock Island Interchange will not be together and we will have to switch out these cars in order to get them together to deliver to the Rock Island Interchange. This is true of the other industries in Benton and in the other towns which we switch.

After finishing switching at Benton, we must pick up cars and shove back over the same public crossing onto the main line and hook up with the rest of our train. The conductor will be at the northern most unprotected crossing to flag it and to join the train, that is, couple the train together. The rearman will flag the Bauxite to Sheridan Highway and couple the train there.

We then move on to Malvern, where we set out and pick up cars and sometimes deliver to the Rock Island Interchange. In setting out and picking up cars, it is necessary for every man to place himself so that the proper switch can be thrown, crossings flagged, and signals can be passed for these moves.

Our next switching is at AB CO where we may set out and pick up cars and in this operation the rearman

flags an unprotected crossing. This crossing is the cut off road from Interstate 30 to Highway 67 and has a lot of traffic. The swingman removes the derail. The headman lines the switch. The conductor is still on the caboose, still a mile or more back.

From AB CO, we proceed to Arkadelphia. At Arkadelphia, we just have a picking up and setting out operation. We will usually have 20 to 35 cars to set out here and because of the curvature of the tracks on which we set out these cars, it is necessary that the three brakemen space themselves to pass signals. In addition to passing signals there is a public crossing to be flagged and we have switches to be lined. Fewer than three men could not make these moves safely. The conductor is on the caboose of the train which has been cut and left on the main line. The train will still consist of 80 to 100 cars and therefore the conductor will be about one mile away from our operation.

This long barrel local normally takes from fourteen to sixteen hours to work from North Little Rock to Texarkana. If, at each switching point, we had to wait for the conductor to come forward from the caboose, we could never hope to complete this operation within sixteen hours which is as long as this crew can work consecutively under the federal law. If we had only a three-man train crew, it would still be necessary for one man to ride the caboose and he would have to come forward at each switching point in order for the operation to be safely completed.

In switching Gurdon, we leave the main line track and go onto the El Dorado branch line keeping hold of our full train. After leaving the main line, the one man will cut the train at a public crossing. We leave that part of the train and that man and proceed to the old yard. We usually have about 40 cars to set out there. It is necessary that all three men pass signals in order for this operation to be made safely. In returning to the

main line, we are backing our train around a curve and it is necessary for all four men to scatter out in order to pass signals to the engine crew for this movement. This backing move to return to the main track must be signaled on the fireman's side for relay to the engineer.

In switching at Bierne, we switch the saw mill and there are several close clearances on this track. There are two rails at Bierne with bad curves on both and it is necessary that all three brakemen perform their duties in order that the moves here be made safely. In switching Cabe Hardwood Mill, it is necessary for one man to remain at the public crossing because we switch over that crossing several times. The other two men are doing the coupling, setting hand brakes and letting off hand brakes, spotting the cars and passing signals.

At Prescott on the south trip, we set out cars and pick up cars. On the north trip through Prescott, in order to set out cars, we usually drop them. The rearman will ride the cars being dropped in order to set the hand brakes to stop the cars. The swingman lines the switch after the engine has passed over it so that the drop can be made and the headman pulls the pin, uncoupling the cars from the engine to make the drop.

Going into Hope, we pull into the passing track to cut our train. We proceed forward and shove onto the yard tracks which lead off the passing track. We shove cars for Nashville, Arkansas, which we set out here, onto Track 2 and the Texas cars on Track 3 where other Texas cars are located. These moves will be made back and forth over Hazel Street which by company rule, must be flagged at all times while switching is performed in this area. The conductor will be on this crossing providing the flag protection. The rearman will catch the cars kicked into the Nashville track and those kicked into the Texas track, and set hand brakes on those cars to stop them or see that they couple onto cars already

there to keep them from rolling back. The swingman will operate the switches and the headman will be positioned to pass signals to the engine crew. It is necessary to pass signals because of the curved track and obstructions close to the track. These obstructions consist of platforms where machinery is unloaded from cars.

The cars on the Nashville track then must be shoved beyond a public crossing which must be flagged. The rear portion of these cars are cut and the remainder pulled back off of the crossing. Here it is necessary that the head man and swingman position themselves in order to see and pass signals. The conductor must still be on the Hazel Street crossing.

In switching Hope proper, which is usually done on the north bound trip of this long barrel local, we switch a feed mill which leads off of the Hope yard and because of the curvature and close clearances at the feed mill, each man is occupied in passing signals and spotting the cars. The conductor will be at the Hazel Street crossing providing flag protection. There is a lumber company in this same vicinity and it will take the same number of people to switch as does the feed mill.

In switching Stephens Grocery and a feed company which are on the same spur, the rearman will ride the head car being shoved, protecting two crossings as the train passes those crossings. The conductor will be situated at the third crossing to flag it. The swingman will get the derail which is off the main track on the spur and ride the cars to the vicinity of Stephens Grocery where there is a curve. He positions himself in this curve to pass signals. The headman will line the switch from the main line, ride the cars, then get off and position himself to pass signals to the engine crew from the swingman who is watching the conductor for his signals. The conductor is watching the rearman who is spotting the cars, making the cut and setting the hand brake for the delivery of the cars to the feed company.

In delivering cars to the Louisiana and Arkansas Railroad and the Frisco Railroad, we must leave the main track, go onto the L&A track to the east around a partial curve over two street crossings and then over U. S. Highway 67 crossing and four other public street crossings. The conductor remains at the main line switch. Highway 67 must be flagged and fusees set out on each side of the track at this crossing. Cars delivered to the Frisco Interchange must be shoved around a curve, and the rearman rides the head end of the cars being shoved and flags one crossing and if we have hold of enough cars, flags two crossings. Each of these crossings must be cut and signals relayed from the rear man to the swingman, who relays the signals to the head brakeman who in turn relays the signals to the engine crew for the making of the proper moves.

We then make delivery to the Louisiana and Arkansas Railroad Interchange. This delivery is usually made by dropping cars with the swingman handling the switch, the headman pulling the pin, and the rearman riding cars to set the hand brakes.

From Hope we proceed to Texarkana where we put our train away.

Our trains are equipped with radio communications equipment in both the locomotives and the caboose. However, about 40 percent of the time, the radios on the local freight cabooses do not work.

In addition to performing the switching duties which I have described, the brakemen must at all times and at every opportunity, inspect the train, both while the train is in motion and while the train is stopped. The brakemen are at all times, from their position on the train, keeping a lookout at the train for hot boxes, sticking brakes, dragging equipment, shifted loads, and any other malfunctions or defects in the train.

Because of the situations and conditions which I have described, it is my opinion that the presence of the three

brakemen and conductor on these trains is absolutely necessary for the safe operation of the train both for the safety of the crew who work in and out between the cars, on the sides of the cars, behind the cars, and in front of the cars, and for the safety of the general public who use the public crossings over which we move or switch or who work at one of the numerous plants that we switch. Trainmen work at a hazardous occupation. To take one man off this crew would multiply the hazards.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 22—

Cross-Examination,

By Mr. Light:

Q. State your name, please, sir? A. Wendell Pickens Chesshir.

Q. Where do you live, Mr. Chesshir? A. 1505 Skyline, in North Little Rock.

Q. What is your Union affiliation? A. I am with the Brotherhood of Trainmen, Lodge 49.

Q. What official position do you hold in that organization? A. None.

Q. Have you in the past held an official position with the organization? A. No, sir, I haven't.

Q. Mr. Chesshir, I direct your attention to your testimony concerning the work done in the North Little Rock yards in preparation for leaving with this train that you refer to as long barrel local. You indicate that the engine crew and two brakemen ride the engine into the 100 yard to pick up the train. Is that correct? A. That is correct.

Q. And that is done then by a crew of four men? A. Yes, including two brakemen and the engine crew.

Q. You indicate that at the yard one of the brakemen will secure drinking water for the caboose. Isn't drinking water supplied by the supply man? A. Yes, at the present time it is, but it wasn't up until just a short time ago. I don't recall the date.

Q. Is this long barrel local still your assignment? A. Well, no, sir, I am on the extra board, but I do work it quite a bit.

Q. How recently have you worked it? A. Tuesday and Wednesday of this week.

Q. Did it perform switching operations at all of the points between here and Texarkana which you referred to in your testimony? A. No, sir.

Q. When you worked it last week, at what points was switching performed by that train? A. I believe our first stop was Bryant and then we picked up and set out at Arkadelphia in the work yard and the team track, picked up off the gravel pit lead.

Q. Is that all? A. Then we went to Gurdon and switched the Gurdon yard. Let's see. Then we go to Prescott and shut out.

Q. Let me make certain that you understand my question. I am asking about the switching that you did on this particular trip. A. This is the particular trip.

Q. Prescott was after Gurdon? A. Yes.

Q. They set out there? A. Yes.

Q. All right. A. And then at Hope we set out and picked up.

Q. And on into Texarkana and tied up? A. That's correct.

Q. How long did it take you to make that trip? A. Let's see. I will have to do a little figuring here. Approximately thirteen hours. We made 54 minutes overtime.

Q. So you were on duty twelve hours and fifty-four minutes? A. No, because you have got to back up 13, 14 minutes. You are going overtime 11 hours and 46 minutes.

Q. Then you were on duty 12 hours and 40 minutes? A. Well, that is approximately. I said approximately thirteen hours.

Q. I direct your attention to page 3 of your testimony where you describe the switching operation at Cash

Wholesale. Isn't it true that that is a long lead into that industrial facility? A. Yes, it is.

Q. It is on flat, unobstructed ground, isn't it? A. Well, it would depend there. In other words at Cash, when you are going back into Inmar No. 1, you are backing into a curve—I don't see a blackboard around where I could draw it.

Q. Just describe it for us, Mr. Chesshir. A. But you have, in other words, in this backing movement you would have a curve to the right and a little straight road and then you go around a sharp curve to your right and that is in a backward movement.

Q. How many cars do you usually handle into Cash Wholesale? A. Well, on this long barrel, in other words, you don't stop there very often because 738 and 739 usually do this but this is a local and we used to work that all of the time prior to 738 and 9 usually never over six or eight cars.

Q. Handling six or eight cars into that lead, signals can be passed from either side of the train can't they? A. Yes. Let me go a little further on that. Usually in working Cash Wholesale, we tried to work it from the engineer's side because of those close clearances on the door pads that extend out for those bumper pads for clocks because that is very close.

Q. Now, how many men actually engage in this switching operation at Cash Wholesale? A. Well, you have got your two engine crews.

Q. Two brakemen? A. And two brakemen and usually by the time you get to Cash Wholesale, the rear man will walk over if he don't have too awful long a train. If he has, why, two men will do that.

Q. Normally the conductor and the rear man would be on the caboose while the balance of the crew is switching Cash Wholesale? A. Well, I won't say "normally", but perhaps it will be fifty-fifty.

Q. About half the time the two men would remain in the caboose? A. Yes.

Q. And about half of the time the rear brakeman would walk over? A. That's right.

Q. Is that correct? A. That's right.

Q. When he walks over, what do you do? A. Well, usually when he walks over, he will stop at those doors.

Q. And watch the work? A. And make the joints. If we haven't already gotten that far along, he will be there ready to make the joint and joint all the cars up because there can be anywhere from one to twelve. I have seen twelve in there right around Christmas time and you have to spot, you usually have to uncouple each car to spot it.

Q. I direct your attention to your testimony concerning the A. P. & L. spur track. How many cars are usually handled into that spur? A. Usually one to six, but they have used it for a storage track and I have seen 26 or 7 in there.

Q. Those 26 or 27 cars are not cars being handled by your crew during switching operations, are they? A. Well, that would depend. I have seen them take bauxite ore out there and store it and if you had materials for A. P. & L. behind there, either going in or coming out, you could be forced to move it back to the main line, before making your switching operation.

Q. Did you indicate that the maximum number of cars you recalled handling into that A. P. & L. track was six? A. Now, that is the spot for the industry, for A. P. & L. industry.

Q. Is there anything about that track that would prohibit you from passing signals from the engineer's side when you are handling as many as six cars? A. Yes, sir, you have one, two, three, four. You have five gates that you have to open and some of them have company locks on them and are chain link gates that you have to pull apart. Some of them are one gate.

Q. What do the gates have to do with the side you pass signals on, Mr. Chesshir? A. Well, because you have a bad curve. In other words, in a backward movement it would be a bad curve to the right, right off main lines and it is actually from there to the unprotected road crossing there is a double S curve.

Q. How many men actually participate in the switching operation on this A. P. & L. track? A. Well, usually by that time you have all three brakemen there when you stop at Cash Wholesale. The rear brakeman most always comes over and we have three brakemen there.

Q. I believe you testified earlier that about half the time the rear brakeman most always comes over and you usually have three brakemen there. A. Well, that is correct, but if he is over there, but it has been done with two where you have got a small amount of cars.

Q. Does your testimony still hold then that since the rear brakeman comes over about half of the time at Cash Wholesale, then he will be available about half the time when you get on down to A. P. & L. to assist in the switching operations? A. It will have to stand that way.

Q. And the other half of the time at the A. P. & L. track, the conductor and third brakeman will be on the caboose? A. Yes, sir.

Q. You describe in your last sentence on page 4 an operation at the Inmar plant involving the swing man throwing the switch for the main line and the rear man moving the derail. Can you find that? A. Yes, sir.

Q. What is there to keep one man from performing both of these operations? A. There actually isn't any other than the time involved, because, you are usually when you pull up there, you have the whole thing blocked, and by the time the swing brakeman gets the switch, walks back to your derail——

Q. I direct your attention to your testimony about the switching at Bryant where you indicate in the last para-

graph on page 5 that when you reach Bryant, you have the cars picked up at the previous switching point ahead of the cars to be set out at Bryant? A. Yes.

Q. And this results in the engine having hold of eight to fifteen cars going into the Bryant spur. Have I correctly outlined what you say? A. Yes, sir.

Q. Wouldn't it be an easier operation to place the cars to be set out at Bryant in the track just clear of the main line and put the cars that you picked up at previous switching points back on the main line and then go into the Bryant spur with the engine to do the spotting? A. Well, no, because you usually have some cars coming off of both rails and perhaps some cars on one rail to be moved over to another rail so you wouldn't be helping a thing by doing it in that operation.

Q. Mr. Chesshir, let's see if you and I are talking about the same thing. There is nothing to keep you from doing what I just described, is there? A. Yes, I believe there would be. It would depend. That is a dualfold question. If you didn't have very many cars, it would work, but if you had, say, 12 or—let me think a minute—seven—it would depend on the number of cars in each rail. There are lots of times you will have six, eight cars on the house rail and then on the snake rail I've six and seven in there and it just doesn't hold very many. It would depend upon the circumstances all together.

Q. Let's assume the situation you described in your testimony and that is that the engine will have hold of 8 to 15 cars, which will be cars picked up at previous switching points that are not to be set out at Bryant. Is that correct? A. That's correct.

Q. How many cars do you usually have to set out at Bryant? A. Well, you have anywhere from four to eight, nine or 10. Let's say 4 to 10.

Q. Well, let's say that the engine has 10 cars to set out at Bryant and 5 additional cars that are picked up at other

switching points which would be 15 cars. Now, why can't—— A. First, if you are going to do it that way, you always, you have always got to take into consideration you are going to have from one to three, one to eight or seven over there on the house rail, so the house rail will only hold about 11 cars to the clearance point without making a cut and usually they always want you to make a cut back there for trucks to back in. Your snake rail, it will only hold approximately 8 to 10 cars.

Q. Well, we are operating under the assumption that you had 10 cars to set out which you told me was about the maximum you ever set out at Bryant? A. That's right.

Q. Why couldn't you put those 10 cars into either one of these rails clear of the main line? A. You could if there wasn't any cars on the other rails, you could do that.

Q. And then you could return the cars picked up at previous switching points back to the main line and then go back in and do your spotting at Bryant, couldn't you? A. Yes, sir, you could if you didn't have, if you had enough space.

Q. You mentioned the switching operation at Bauxite that involved largely cars coming from or going to the two large bauxite industries there, aluminum industries there, is that correct? A. That's correct.

Q. Where is that switching done by the crew that you are a member of? A. It's usually performed——

Q. Are you referring to the long barrel local now? A. Yes, sir.

Mr. Ross: I believe the long barrel local is the only train whose operations you described in detail in your testimony, isn't it?

The Witness: That's correct. However, it would apply to 738 and 9 as well.

By Mr. Light: Q. Where is the switching performed by the long barrel local crew at Bauxite? A Most of it is done on the south end of the south lead; however,

there would be nothing unusual for us to go to the north end to run around the other end to get some out.

Q. When you speak of the north end and the south end you have reference to the joint yards of the Missouri Pacific and the Bauxite and Northern Railroad Company operate there? A. That's right.

Q. Have you had an opportunity during the time that you worked on the long barrel local in and around the bauxite yards to see switching operations performed by the Bauxite and Northern Railroad employees? A. No, I haven't actually. In a sense I haven't because there can only one work at a time because you have only got the one lead on each end.

Q. How many men on the long barrel local participate in the switching operations in those bauxite yards? A. We always have three there because we always pull the cab in the clear and the conductor will be there also and the rear brakeman.

Q. What does the conductor do in connection with those switching operations, if anything? A. He usually, he and the rear brakeman usually walk up through the yards to find the cars because, especially in the morning, after the bauxite yard crew goes to work, they change everything up and often it won't be as the list says it is.

Q. Is this the pick ups and set outs that are performed by your crew at the bauxite yards? A. Mostly the pick ups from Gum Springs.

Q. These will be cuts of cars that have already been assembled? A. No, sir.

Q. And set out by the B & N forces? A. No, sir; they are scattered. They are not placed.

Q. You are not telling me that you have never seen the Bauxite and Northern switch engine in operation, are you? A. No, sir; no, sir.

Q. You have seen it in operation? A. I have seen it, but not to the point of watching.

Q. Do you know what size switch crews the B. & N. Railroad uses to switch those yards? A. Yes, sir.

Q. What size? A. They usually have two brakemen and the conductor.

Q. And an engineer? A. Yes, sir.

Q. So it is a four man crew? A. Yes, sir.

Q. Have you seen the locomotive operated by the Reynolds Metals Company in and around that yard at Bauxite? A. Sir, I have never seen anything but the B. & N. there.

Q. You are not familiar at all with the rail operations conducted by Reynolds Metals? A. No, sir.

Q. Would it surprise you to know that they conduct switching operations with a two man crew, an engineer and a helper? A. Yes, in a sense it would.

Mr. Lessenberry: I object to the form of the question.

Mr. Light: Go ahead and answer it.

The Witness: I have answered it.

Mr. Light: I didn't hear your answer.

The Witness: I said yes.

By Mr. Light: Q. It would surprise you? A. Yes.

Q. I direct your attention to your testimony on page 9 where you indicate that in or around Benton the head man calls the dispatcher to get track and time to clear the east main track. Have you found that? A. Just a minute. All right, yes, sir.

Q. Now, how does he call him, by what device? A. He goes to the telephone.

Q. Why isn't your radio used for that purpose? A. It is out of range with the dispatcher unless he has his, from his Little Rock office here it doesn't reach there. Now, he can cut the tower in at Benton when he wants to talk to you, but we have no way of cutting the tower in order to reach him. The range is too far.

Q. You can reach the tower at Benton from radios on your train, can't you? A. Yes, sir, but the dispatcher is in Little Rock.

Q. But the tower in Benton is in contact with the dispatcher, isn't he? A. Well, it's possible, yes, sir, but that is not the practical way because the man, the agent, whoever answers you at Benton, he has work to do too and we have got to come down there right by the telephone and so there is nothing——

Q. Any member of the train crew, of course, would walk to the telephone and make this call, couldn't he? A. That's correct. It is most always done by the brakeman. In other words, the head brakeman is usually the closest man. And that is the reason I put on here designated as——

Q. Have you served in through freight services as well as local freight? A. On the extra board, yes, sir.

Q. Have you ever acted at the position of head brakeman on a through freight train? A. Yes.

Q. And in local freight service have you occupied the position of head brakeman? A. Yes.

Q. You, therefore, have had an opportunity to observe the engineer and fireman in carrying out their duties on both of these types of trains? A. Yes, sir.

Q. As a result of your observations, you have made, would you know how to stop a locomotive if the occasion arose for you to stop it? A. By the emergency valve, yes, sir.

Q. Would you just describe briefly what you would do to stop a locomotive? A. Well, as I said before, I would just grab hold of the emergency valve and pull it open.

Q. That is not a difficult operation at all, is it? A. Not for me it isn't.

Q. There has been some testimony from the firemen in this case that leaves the implication that trainmen aren't smart enough to figure out how to stop a train.

Mr. Ross: I object to that question.

By Mr. Light: Q. There is not anything to that, is there, Mr. Chesshir? A. Let's repeat that again now.

(The question was repeated by the reporter.)

Mr. Ross: I object to that question because in the first instance I don't recall any such testimony and in the second place I don't think it is a proper question to ask this witness. It is argumentative and I object to it on those grounds.

The Witness: You say they say we are not smart enough to? Is that what you are trying to get at?

By Mr. Light: Q. Mr. Chesshir, I have inferred that from some of the testimony that has been given. A. Well, that's wrong.

Q. I agree with you, sir. At page 18 of your testimony you indicate that about 40 per cent of the time the radios on the local freight cabooses are inoperable. Do you sometimes serve as conductor in these freight operations? A. Yes. I never have served—let me say this—I never have served as conductor on 734 and 5, but I have on 738 and 9 and some of your other locals.

Q. Have you on occasions when serving as conductor found the radio in the caboose to be inoperable? A. Oh, yes, on the Hot Springs local it was weeks before we had radio over there.

Q. Because the radio was not functioning? A. That is correct.

Q. Then you were conductor on this run on a number of occasions? A. That's correct. I won't say a number, but several times.

Q. About how long ago was that? A. That was last year.

Q. Are you familiar with the general notice that requires the conductor to report any inoperable radio at the first open agency? A. I am.

Q. And did you file that written report required by the notice on each occasion when you found that radio to be inoperable while you were conductor? A. Usually I always filed on the first day that I was on there and that was it.

Q. How many such written reports have you filed as conductor since that general notice went into effect? A. I can't answer you. I can't answer you. I don't rightly know.

Q. But your sworn testimony is that you have filed at least one? A. Oh, I filed more than one, but not as conductor. I filed some of them as brakeman.

Q. Give me your best estimate of the total number you have filed either as conductor or brakeman?

Mr. Ross: I think he has said he can't answer that.

The Witness: I don't know. I never have kept up with it and actually let's clarify some stuff about this because this is a two-fold question. When I refer to this, in other words, sometimes you can hear on this radio but can't transmit. In other words, a lot of times it will transmit and you can't hear and so in other words, this is included in this—or either that or you don't have any radio on your lead unit and so then of course you are still just as helpless as if you didn't have one.

By Mr. Light: Q. Going back to the written reports of radio difficulty, have you filed as many as five? A. I can't answer you. I don't rightly know. I feel like that I have but I wouldn't—I just don't know.

Q. What runs have you worked in through freight service? A. Well, sir, over the last three or four years, I believe I would be safe in saying I have worked every one of them.

Q. All right. Then you have worked on the run from North Little Rock to Texarkana? A. Yes, sir.

Q. And that amounts to taking a through freight train that has been brought from Poplar Bluff to North Little Rock by another crew from North Little Rock on to Texarkana, is that correct? A. That's correct.

Q. That train is then taken over by another crew from North Little Rock on to Texarkana, is that correct? A. That's correct.

Q. That train is then taken over by another crew and

taken on to somewhere in Texas? A. That's correct. Of course, a lot of times that train comes in to the yard and it is switched and remade over. It doesn't necessarily mean it is step-off and step-on operation.

Q. What size crew is it that picks the train up at Texarkana and takes it on to Texas? A. They have a conductor and two brakemen.

Q. What size engine crew? A. Engineer.

Q. So it is a four man crew that takes it on into Texas? A. That's right.

Q. And what size crew were you a member of that took it from North Little Rock to Texarkana? A. Six members.

Q. Have you ever been on a train over the line in Texas that that train goes over? A. No, sir.

Q. So if there are any differences in the circumstances of that train's operation after it leaves Texarkana, and goes into Texas from those circumstances that prevailed from North Little Rock to Texarkana, you just wouldn't be familiar with those? A. Not at all.

Q. You don't know why they can operate it with four men in Texas and it takes six up here? A. No, I don't. I have never been down there on the railroad.

* * * *

Redirect Examination,

By Mr. Ross:

Q. Mr. Chesshir, are there usually any cars in the tracks that you switch at Bryant? A. Yes, sir, there are. There most always will be one to four over on the snake rail and one to four over on the house track and then too, you have a split derail that runs way back up on the lead up there and when you shove cars back in this you will have to get it over that and that cuts way down on your space.

Q. Have you ever made an emergency application of

the brakes from the cab of the lead locomotive? A. No, sir.

Q. Have you ever made a service application of the brakes from the lead cab of the locomotive? A. No, sir.

Q. These are separate brake valves, are they not? A. Yes.

Q. Mr. Chesshir, are you familiar with any regulations providing for the amount of clearance that has to be left between a building and the center of the track? A. Bob, I guess I'm not in a sense.

* * * *

By Mr. Lessenberry: Q. Mr. Chesshir? A. Yes, sir.

Q. You described certain switching operations that occurred on trains that you had ridden. If you would, tell me the general area of the Cash Wholesale house in relation to the City of Little Rock. A. Just a minute. Let me find that street.

This is Forbing Road. It is in the City Limits of Little Rock, on the southwest side of town.

Q. Just a minute. Is this generally in the area referred to as "The Industrial District"? A. Yes.

Q. Are you also familiar with certain residential districts that have been constructed around that new industrial district? A. Well, yes, there is some new industrial, I mean new housing additions in that area.

Q. Would you describe traffic or motor vehicle traffic by the public as being light, moderate, heavy, or just how? A. Well, it's always heavy in your daylight hours, but in your working, from seven until five or five thirty in the afternoon, it is very, very heavy there.

Q. Is Cash Wholesale separated from a four lane highway by the railroad tracks? A. Yes.

Q. And then there are certain intersections from this four lane highway across the railroad tracks through these residential and industrial areas? A. That is correct. Peo-

ple from the southwest part of the City use this Forbing Road to get to the industrial, 65th Street industrial area.

Q. Now, in line of keeping it brief, are these several cities which your train services, such as Gurdon, Prescott, Hope and Arkadelphia, almost divided by the railroad tracks that go through those towns? A. That's correct. Benton is divided. Malvern is divided. Donaldsonville is divided. Arkadelphia is divided in a sense. You have got an industrial area building on your east side. Gurdon is divided, Prescott and Hope.

Q. When we say "divided", we mean that the railroad tracks run almost through the geographical center of the town right along the business areas of these various communities? A. That's correct, with the exception of Arkadelphia. Arkadelphia is not right in the business end of it, but you have an industrial area there and some residences over on the east side.

Q. Mr. Chesshir, there has been some testimony about private crossings as opposed to public crossings. Are you familiar in your duties with the difference between a private crossing and a public crossing? A. Well, as far as brakemen are concerned, a crossing is a crossing, regardless. In other words, if people travel it, it has to be protected.

Q. Now, are you instructed as to the type of vehicular traffic that might use any particular crossing? A. May I ask you to verify that or clarify that?

Q. I just asked you if you have any instructions if you see a school bus or a mail carrier on a particular crossing that you are supposed to report that? Do you have any knowledge between what is a public and what is a private crossing? A. Well, I can't actually answer you except with the fact that, as I said, a crossing is a crossing and if it is used at all, why, we try to do our best to protect it.

Q. All right. Now, one final question. The area of Little Rock that you have described as the southwest area, is

that a new development of the City of Little Rock in the past, say, ten years? A. Oh, yes.

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INTERVENORS' EXHIBIT NO. 23—
Testimony of J. D. Kelley.

My name is J. D. Kelley and I am employed by the Missouri Pacific Railroad Company. I went to work for the Missouri Pacific on December 17, 1941 and I have been working for Missouri Pacific since that time with the exception of three years when I was in the military service. I first went to work as a brakeman and now am a qualified conductor. I was promoted to conductor in 1957 and am presently operating as a conductor.

For most of the past three years I have been working on the Helena, Arkansas, to Wynne, Arkansas, turn around local as brakeman. This is a local train doing station switching between Helena and Wynne and return to Helena each day, seven days a week. The distance between Helena and Wynne is 58 miles and the round trip is 116 miles. This round trip takes from nine to sixteen hours with the average time about twelve hours.

This train pulls anywhere from 30 to 90 cars with the average number being about 50 cars. This local is ordinarily operated with one engine. I usually operate in the position of swing brakeman on this local. In going on duty at Helena we read the bulletin board, pick up train orders, get our instructions, get the waybills and then we ride the engine down to the train. We all go on duty at the depot. We get on the engine after the engine has been turned and has been serviced and checked by the engine crew. The brakemen will get off at the caboose as will the conductor. The engine crew will take the engine on down and put it on the train. The head brakeman will couple up the air on the entire train. The swing brakeman will get the switch list and will walk the train putting down

the initials and numbers of the cars in the train. The rear brakeman will get drinking water, coal, flagging equipment, and other necessary supplies. The air brake test is then conducted. When the air brakes are set the rear brakeman will walk to the front end checking to see that the brakes are all properly set. The brakes will be released and the train will then pull by and the rear brakeman will check to see that all brakes are releasing properly.

The rear brakeman and conductor and I (swing brakeman) will all ride on the caboose. The conductor and I will run the waybills. I call out the numbers from my switch list and he will tell me from the waybills where the cars go and I put down the station number of the cars' destination on my switch list and I will use this switch list to switch by when we arrive at the stations.

If our train has been made up in the yard at Helena we will have to pick up our train from several different tracks. The tracks here hold only from 15 to 17 cars. In coupling these cuts of cars together to make up our train, we will be moving across a public crossing and around curves. The crossing will have to be flagged when we are shoving over it and it will be necessary for signals to be passed on the curves and it will be necessary for one or more members of the crew to be coupling up the cars to join the train together. We go to work at 12:05 a. m. every night and it takes approximately 50 minutes for us to prepare to leave and start our road trip.

We occasionally do some switching at Lexa and then we move on to Marianna where we perform switching at the Douglas and Lomason Automobile Plant. This track is on an S curve and we have to first move some cars out of the way on this track. We catch hold of these cars and move them to the main line, return to the plant with the engine and get the cars at the plant, bring them out, switch these cars out to get the cars that we are

going to take with us and then we get what we are going to spot at the plant and shove back into the plant and spot. We try not to have hold of more than 7 or 8 cars when we switch this plant because if you have hold of more cars than that, the signaling has to be done on the fireman's side. The brakemen will have to spread out to pass signals at this plant because of the curve and the close spots.

The city of Marianna has about eight crossings over which our train will move during switching in Marianna. These crossings will have to be flagged when we shove cars over them. When we head over the crossings with our engine, the engine crew will protect the crossings by visual lookout. At times at Marianna we have to switch bean elevators and spot limestone. In order to do this we go around an old cut off track over these same public crossings that I mentioned and some of these crossings will be located on a curve and they have to be flagged. There is one bean elevator on this track where there are close clearances and because of the curve of the track and the close clearance the brakemen have to spread out in order to pass signals to the engine crew. In switching the RA siding here we will frequently have twenty or twenty-five cars and because of the curve will take three men to pass signals in order to set out that many cars at the RA siding. Going north the curve is on the fireman's side of the train.

When we spot the compress going north at Marianna it is on a curve and it is on the fireman's side and we have to pass signals on the fireman's side for him to relay to the engineer to make the appropriate moves. In switching the compress the rear brakeman will be coupling up the cars and I will be passing signals from the rear brakeman. The head brakeman will be lining switches and helping to pass signals to the engine crew.

Our train will then leave Marianna with the rear brake-

man and I and the conductor riding on the caboose. The conductor and I will go through the waybills on the cars that I picked up and we will list them and keep our switch list current.

During any switching outside of yard limits the train will have to be afforded flag protection to the rear by a member of the crew unless relieved by train order from doing so.

The conductor has various reports to keep on this trip. He has to wheel the cars on a wheel report. On this report he has to list the car number; the railroad it belongs to; whether it is loaded or empty; whether it is a boxcar, flatcar, coalcar or whatever type car it is; if it is loaded, the commodity it is loaded with; the net weight of the car; the destination of the car and where we picked the car up and where we leave the car.

The conductor also must make out blind siding reports and keep his 2704 report current. The 2704—"Time Return and Delay Report of Engine and Train Employees" —is a report on which the conductor must list the following information:

Division of railroad

Time slip numbers

Date and year

Departure:

- Station number of station departed from
- Time called for duty
- Time went on duty
- Time train departed

Arrival:

- Station number of station arrived at
- Time of arrival
- Time at rest in receiving yard or station

Time off duty
Actual miles run on this trip
Train number
Engine number or numbers
Kind of service performed

Name of station where first went on duty. Date and time.

Length of time off duty previous to this trip.

Name of station where finally go off duty. Date and time.

Total hours and minutes on duty.

Name of conductor and name of each brakeman and social security number of each man.

Time claimed (claimed amount of time and miles run at punative or pro rata rate).

Delay Report:

(The following information has to be listed for each delay experienced by the train, such as stops to perform switching, stops to correct malfunctions, etc.)

Name of station

Time delay began

Time delay ended

Length of time and cause of delay

Tons and number of cars

Station number from which car picked up

Number of loaded cars

Number of empty cars

Total number of cars in the train

Net tonnage

Gross tonnage

Name of engineer

Name of fireman

Caboose number

Certify report to be correct and list your occupation (conductor).

Remarks:

Total cars handled
Number of empties
Net tons
Gross tons
Adjusted tonnage of all cars handled on entire trip
Such other information as is necessary, such as setting out an engine, setting out a car with a hot box, etc.

Our next switching is in Wynne. At Wynne we turn into a regular switch engine. We do flat switching, city switching, train switching, we line up different cars for different trains and make transfers to different tracks for them to pick up and we do anything else that the station agent tells us at Wynne. Here our whole crew will be out working. The conductor will handle his own list at Wynne, that is the switch list, and do his own switching. The conductor will have his instructions as to which cars go where and it will be up to him to determine the manner in which we should switch in order to get the cars to the proper destination. This is a complicated process figuring out how the moves can be made to get the cars to the proper destination as these cars may be scattered over the entire yard and may be in the middle of cuts of cars and have to be switched out. The brakemen will line switches, ride cars, pull the pins and set hand brakes, couple cars and, of course, pass signals for

the proper moves to perform the switching. On these switching moves the swing brakeman ordinarily will be lining switches for the moves of the cars, the rear brakeman will be riding cars and setting the hand brakes and bleeding the air off cars. And the head brakeman will pull the pins to uncouple the cars. In switching here the rear brakeman does the same work as the long fieldman on a switch crew, the head brakeman does the same work as the pin puller on the switch crew and the swing brakeman does the same work as the short fieldman on the switch crew. At times while switching here we will have hold of from 25 to 30 cars or more. Some moves are made on curves and it is necessary that every member of the crew be in a position to pass signals to the engine crew to make the proper moves.

At Wynne most of the switching is done in the south part of the North Yard. There is a crossing located approximately three or four car lengths south of the south part of the North Yard. We move back and forth over this crossing a number of times in performing our switching. There has to be some crewman at that crossing when the cars are moving over it.

At times it is necessary to drag cars through the East Y and shove them down the Memphis main track to be set out in either the Old Sheridan track or the Jolly track for trains to pick up. At times it is necessary for us to drag cars around the Northwest Y down the Memphis main track toward Little Rock and place them in either the New Sheridan track, Old Sheridan track or the Jolly track for pick up by trains bound for Little Rock.

Cars that are set out by other trains on the Memphis main track will be set out in either the passing track, Old Sheridan track, New Sheridan track or the Jolly track. At times it is necessary for us to shove these set outs around the Northwest Y to the North Yard at Wynne. At times it is necessary for us to drag these set

outs up the Memphis main track and shove around the East Y to the North Yard for switching purposes. At times when we are shoving cars through the Y tracks, because of the number of cars we are moving and because of the curvature of these tracks, it will be necessary for all three brakemen to space themselves so that they will be able to pass signals and relay signals to the engine crew. The conductor at times will be lining switches for some of these moves and flagging the crossing south of the south part of the North yard.

We will also do some industrial switching at Wynne. We switch Holstead Copper Plant and it is located on a sharp curve and at times two cars have to be spotted inside the building and in order to do this it is necessary that all the men position themselves in order to pass signals to the engine crew.

There is one place where we deliver piggyback cars and in spotting the piggyback plant you shove over a street crossing and sometimes, depending on the number of cars you have, the engineer will be on a curve and all the men will have to spread out in order to pass signals to the engineer.

Spotting the Y and the Wynne Wholesale Company you will be on a curve and shoving over two public crossings. Here it is necessary for everyone to be spaced so that they can pass signals to the engine crew and, of course, one man has to be on each crossing before the train moves over it.

At these places you will have all three brakemen working passing signals and at times it is necessary for the conductor to be there passing signals right along with you. Several of these places that I have mentioned it is necessary because of the curvature of the track to pass signals on the fireman's side, upon occasion, depending on how many cars you have hold of.

In spotting Arkansas Butane, Cars must be shoved

over a public crossing and around a curve just over the crossing. All the men must be spread out here in order to pass signals for the moves. In addition to passing signals the members of the crew have to couple cars to the train and release hand brakes. Also on cars being set out or spotted the pins have to be pulled to uncouple the cars and the handbrakes have to be set on the cars after they are uncoupled.

We then are ready to leave Wynne to proceed back to Helena over the same track we traveled before. On this return trip we usually do not have a protection order and, therefore, one member of the crew will have to flag to the rear of our train when it is stopped on the main track. The remainder of our switching between Wynne and Helena is similar to the switching that was performed on the north trip. At times we perform more switching and at times, less switching.

Our locomotive and caboose are equipped with radio and communications equipment. However, approximately 35 to 40 per cent of the time the radio in either the locomotive or the caboose will not be in good operating order.

The track over which we operate between Helena and Wynne is what is referred to as a dark railroad. We have no automatic block signals or Centralized Traffic Control and movement over this road is governed by train orders.

I have operated as a brakeman in steam freight service and I would say that the duties as a brakeman in steam freight service and the duties of the brakeman in diesel electric service would be approximately the same with the work in diesel service being more difficult than it was on the steam engine train. This is true, because of the longer trains, the bigger cars and the more industrial switching that we have to perform now than was performed back during the steam engine days.

It is my opinion that three brakemen and the conductor are all necessary for the safe operation of this train. With the many switching operations that this train performs, with the members of the crew moving in and out between the cars, throwing switches and lining derails in front of or behind cars, and riding the cars in the close clearances which some of the switching situations present, make it absolutely necessary that we have all three brakemen and conductor present on this train to perform their duties and contribute to the safe operation of the train. It is essential to the safe operation of the train that moves be made only after the crew has determined that the move can be made with safety to the crew and the general public. It takes every member of the crew to see that the moves are made safely.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 23—
Cross-Examination,

By Mr. Lucente:

Q. Mr. Kelley, would you state your full name and address for the record, please? A. J. D. Kelley, 105 North 5th Street, West Helena, Arkansas.

Q. And you are presently employed by the Missouri Pacific Railroad Company? A. Yes, sir.

Q. When were you first employed by the Missouri Pacific, Mr. Kelley? A. December the 17th, 1941.

Q. Prior to your employment by the Missouri Pacific, had you held jobs elsewhere with other employers? A. Yes, sir.

Q. What were those jobs? A. I worked for the Henry Wrape Company at Paragould, Arkansas.

Q. What kind of work did you do for that company? A. This was a stave mill and heading mill.

Q. And your job with the company was what? A. It was different jobs. At the time that I hired out on the railroad, I was turning headings.

Q. Had you held jobs with other employers in addition to the one you have just described? A. Just odd jobs.

Q. And what formal education have you completed before your employment with the Missouri Pacific? A. My actual schooling, I quit school when I was in the eighth grade and began working.

Q. You started working for the Missouri Pacific in 1941? A. Yes, sir.

Q. What was your employment? In what capacity were you employed by the Missouri Pacific, Mr. Kelley? A. As a brakeman.

Q. Prior to your employment as a brakeman, were there qualification or tests that you passed? A. Yes, sir, there was certain tests.

Q. What did you have to do before you were employed by the Missouri Pacific as a brakeman? A. I had to qualify under the Book of Rules.

Q. You had to take a Rules examination? Is that correct? A. Yes, sir, that is correct.

Q. Did you also have to take certain student trips? A. Yes, sir.

Q. How many trips did you take? A. I believe I taken a trip on each local on our Division and each switch engine I believe at the time at Paragould.

Q. How many trips would that be? A. That would be approximately four or five trips.

Q. Then, having completed those student trips and having passed your Rules examination, you were hired as a brakeman by the Missouri Pacific? Is that right? A. Yes, sir.

Q. Now, in what class of service did you first work as a brakeman for the Missouri Pacific? A. I worked as a brakeman.

Q. In local freight service or some other service? A. I don't recall. It is either in local freight or through freight service.

Q. But it was in road freight service? A. Yes, sir.

Q. As distinguished from yard service? A. Yes, sir. Now, I believe. I wouldn't be certain of that.

Q. Has all of your service on the Missouri Pacific been in road service rather than yard service? A. Sir?

Q. Do you have seniority as a yard helper or foreman or have you worked only in road service for the Missouri Pacific? A. I've worked both.

Q. Both? A. Yes, sir.

Q. In what yards did you work? A. I worked in the Paragould yard.

Q. In what capacity? A. As helper and as foreman.

Q. How long a period of time did you work in the Paragould yard, Mr. Kelley? A. I couldn't truthfully say the period of time.

Q. You don't have any idea as to relative length of service in yards as contrasted with road freight service? A. I worked more in road freight service than I have in yard service I would think. I would think that would be correct.

Q. In road freight service have you worked—you started working I take it as a brakeman, did you not? A. Yes, sir.

Q. When did you become a qualified conductor in road freight service, Mr. Kelley? A. I believe it was in 1957, I believe January the 8th.

Q. Prior to 1957 then had all of your service in road service been as a brakeman? A. Yes, sir.

Q. And working in road service, did you work as head brakeman and flagman and swing brakeman? Did you work all three of those positions? A. Yes, sir, I have.

Q. And did you work such positions in both through and local freight service? A. Yes, sir, I have.

Q. Do you have any idea of which class of service predominated, that is, local service or through service? A. I wouldn't say.

Q. Between which terminals did you operate in freight service, Mr. Kelley? A. In through freight service?

Q. Yes, through freight service. A. I operated between Paragould, Arkansas and McGehee, Arkansas.

Q. And were the terminals the same in local freight service? A. The terminals were not the same on a local freight leaving Paragould.

Q. Now, when you started working as a conductor in 1957, did you work regularly as a conductor thereafter or did you also work as a brakeman on occasions after 1957? A. I have worked both as a brakeman and as a conductor.

Q. And are you presently working regularly as a conductor? A. Yes, sir.

Q. And that is on a turn-around local between Helena and Wynne, Arkansas? Correct? A. No, sir.

Q. What local are you working presently? Are you working presently in local service as a conductor? A. Yes, sir.

Q. What train are you working at the present time? A. The Helena to McGehee local.

Q. The Helena to McGehee local? A. Yes.

Q. I notice your statement says that "Most of the past three years I have been working on a Helena, Arkansas to Wynne, Arkansas turn-around local as a brakeman"? A. That is true.

Q. Your statement, in fact, covers that particular train primarily, does it not, Mr. Kelley? A. Yes, sir.

Q. When you became a conductor in freight service, did you take any promotional examination, Mr. Kelley? A. Yes, sir.

Q. What was the nature of the examination? A. To qualify as a conductor.

Q. Is that your answer? A. That was the reason.

Q. Was it a written examination, Mr. Kelley? A. It was an oral examination.

Q. And about what were you examined? A. The Book of Rules.

Q. This was the same Book of Rules that you were examined about when you first became employed as a brakeman for the Missouri Pacific except for changes which had occurred since that time? A. Yes, sir.

Q. Were there any other examinations that you took at the time of your promotion to conductor status? A. I do not recall any.

Q. Are you a member of one of the unions representing operating employees, Mr. Kelley? A. Yes, sir.

Q. Which union are you a member of? A. The Brotherhood of Railroad Trainmen.

Q. Do you hold any official capacity in that union? A. Yes, sir.

Q. What is that capacity? A. I am Legislative Representative of Lodge 658.

Q. Have you held other official positions with the Brotherhood? A. No, sir.

Q. Mr. Kelley, you have worked on some occasions as a head brakeman in both through and local freight service, have you not? A. Yes, sir.

Q. Working that position in freight service, do you customarily ride the leading unit of the locomotive? A. As head brakeman, yes, sir.

Q. If it became necessary for you to stop that train by utilizing the braking apparatus available on the left side of the locomotive, could you accomplish that? A. Yes, sir.

Q. Now, in your work as a head brakeman have you observed the activities of the fireman on the locomotive, Mr. Kelley? A. Yes, sir, I would say that I have observed some of his activities.

Q. Have you noted at times that firemen will reset a tripped ground relay switch? A. Yes, sir, I have noticed.

Q. Do you know how that operation is performed, that is, how a ground relay is reset? A. The only thing that I

have noticed on the ground relay, they have pushed a button to reset it.

Q. That is the way a ground relay is reset, is it not by pushing a button? A. As far as I know.

Q. Do you know where the isolation switch is on a diesel unit, Mr. Kelley? A. No, sir, I don't.

Q. Do you know how to take a diesel unit off line? A. No, sir, I do not.

Q. As you worked as a head brakeman in local through freight service, do you perform a lookout function while the train is moving? A. Yes, sir.

Q. Does that lookout function involve a forward lookout as well as a lookout to the rear as the train proceeds? A. At times.

Q. What do you mean by "at times"? A. Times the head brakeman's seat is not located where he can see to the front of the train nor can he see to the rear of the train without getting up and walking over to one side or the other and looking out.

Q. As far as the lookout to the front is concerned, Mr. Kelley, you are seated between the engineer and the fireman, are you not? A. Yes sir.

Q. And your lookout to the front then permits you to see signals as they come into view, doesn't it? A. At times it will not.

Q. Is that when the train is in such a position that you cannot observe to one or the other side of the locomotive? A. I am speaking of the position of the brakeman's seat at times will be located to where he cannot observe the signals if he is sitting in his seat.

Q. If you stand in that position, you can observe the signals, can you not? Is that the nature of the obstruction? A. I would have to walk to one side of the jeep engine or the other side in order to be able to see forward or backwards.

Q. What is the obstruction that in some circumstances does not permit you to maintain a full lookout to the front

Mr. Kelley? A. It would be the way certain engines are designed.

Q. What is the design detail that interferes with your lookout? A. The front part of the engine. That is just about all I can say about that, just the front part of the engine. The brakeman's seat on this particular locomotive that I am referring to is situated in the middle of the engine most of the time. You cannot see sitting in this seat that I am referring to, you cannot see to the front. You cannot see to the rear. In order for you to be able to observe signals ahead or inspect the train, it would be necessary for you to get up and walk from one side to the other.

Q. Turning now to the particular detail in your statement Mr. Kelley, I note first that on Page 2 of the statement you referred to an air brake test which is conducted at the initial terminal where your train is made up? A. Yes, sir, where this particular train is made up.

Q. Is that air brake test anything more than just a visual examination of the braking apparatus as the train pulls by? Well, to take it in two parts, the first thing you inspect for is to see whether the brakes are applied when the engineer applies them? A. That's right.

Q. How do you determine whether or not the brakes are applied? A. You will have to walk the train inspecting the brakes to see that they have applied.

Q. That is purely a visual inspection, is it not? A. Yes, sir, it is.

Q. And then when the brakes are released and the train is pulled by, you inspect the brakes again to see whether they have released, do you not? A. Yes, sir, that is true.

Q. That is also purely a visual inspection, isn't it? A. Yes, sir, it is.

Q. You also refer to page 2 of your statement, Mr. Kelley, to problems involved in making up your train at the Helena Yard? A. Yes, sir.

Q. Now, isn't it a fact that on virtually all occasions the train is made up for you by a yard crew? A. Yes, sir, that is true.

Q. And this problem of picking up your train from several tracks, each of which holds only fifteen to seventeen cars does not arise when your train is made up by the yard crew, does it? A. Yes, sir, it can.

Q. Where does the yard crew make up the train at the Helena yard, Mr Kelley? A. Usually the train—I am speaking of this particular train—is made up in either the pass or the main line.

Q. What is the capacity of those tracks? A. The passing track at Helena will hold approximately sixty five cars.

Q. When the train is made up on the passing track, in most cases your entire train will be on a single track, will it not? A. That is true. The same would apply to the main line.

Q. Now, continuing with your statement at pages 3 and 4 you describe switching operations at Marianna and you refer particularly to spotting the compress at that point? A. Yes.

Q. The page reference really should be page 4, Mr. Kelley. And I note that in describing the process of spotting the compress that you have referred to what the rear brakeman and what the head brakeman does and what the swing brakeman does. What is the conductor doing while the compress is being spotted at Marianna? A. Usually the conductor will be working on his various reports.

Q. But he will be in the caboose, will he not, Mr. Kelley? A. At times he will be in the caboose, yes, sir.

Q. He is not participating in the switching movement that your describe in Marianna though, is he? A. Usually he is not.

Q. At page 4 of your statement, Mr. Kelley, you also refer to protection of the train to the rear and your state-

ment is that "during any switching outside of yard limits, the train will have to be afforded flag protection to the rear by a member of the crew unless relieved by train order from doing so." Now, in the territory, between Wynne and Helena that we are discussing, isn't it customary for the railroad to issue wait orders which in effect relieve the local whose work you are describing from affording any rear end protection? A. It is customary and we will usually have a protection order which you are referring to on the northward trip.

Q. And do you have the same type of dispensation on the return trip in that territory? A. Usually on the return trip from Wynne to Helena we do not have a protection order.

Q. You don't have a wait order which protects you on the Wynne trip return trip from Wynne to Helena? A. Usually we do not have a protection order on the return trip.

Q. Is there any other train in the territory on that return trip? A. There could be.

Q. How often do you stop on a return trip from Wynne to Helena? A. Upon leaving Wynne, if we have any cars to set out at Warwick or any work to do at Warwick, we will stop at Warwick.

Q. Is that the one place where you stop on the return trip? A. Usually this train will not stop again until it reaches Marianna.

Q. Mr. Kelley, you describe in some detail the various reports that a conductor fills out and at Pages 4, 5 and 6 and part of 7 you have set out details which appears in the so-called 2704 time return and delay report? A. Yes, sir.

Q. That report is in fact a printed form of report, isn't it, Mr. Kelley? A. Yes, sir, it is.

Q. And it is a single page form, is it not? A. Yes, sir, it is a single page form.

Q. And the information that the conductor puts on the form is largely information that is in response to particular headings appearing on the form, is it not? A. Yes, sir.

Q. Now, you have listed a great deal of information at Pages 5 and 6 of your statement which appears at the top half of the report which involves primarily time on duty, miles run, et cetera. Isn't it true that the top half of the form which is the time return can be filled out completely either before departure from the initial terminal or after arrival at the place where the crew goes off duty? A. Are you speaking of the top half of the form?

Q. Yes, sir. A. Most of this information can be entered at the time of departure?

Q. There isn't any reason why the conductor has to spend any time on route filling in the top half of that form at all, is there, Mr. Kelley? A. Well, he would have to have time to fill the report out is all.

Q. You also referred to the delay of report which is the bottom half, the second half of this form. That particular information relates only to stops between the initial and final terminal, does it not? A. You will show delays beginning at the initial terminal.

Q. If you are delayed in leaving the initial terminal? A. True.

Q. But once again the information called for is called for by a printed form which has another heading and which calls for specific items of detail as to each delay, isn't that true, Mr. Kelley? A. That is true.

Q. You refer also to the process of wheeling a car. Now, to break that down a bit, when your train leaves the initial terminal, you are given a wheel report that has been prepared by other than the train crew, are you not? A. Yes, sir, upon leaving the initial terminal.

Q. So the only wheeling that you do is with respect to cars which you pick up on route, is that correct? A. That is correct.

Q. How long does it take you to wheel a car, Mr. Kelley? A. Actually I don't know the exact time it would take to wheel a specific car. It would just take time to get the information from the waybill and write it down on the form.

Q. You are given the waybills with respect to cars that are picked up on route, are you not, Mr. Kelley? A. Sir?

Q. You are given the waybills with respect to the cars that you pick up at intermediate stations, aren't you? A. You——

Q. As conductor, that is? A. You pick up the waybills, ordinarly speaking you will pick up the waybills at the intermediate station.

Q. And the information you put into your wheel report with respect to those cars is taken directly from the waybill itself, isn't it? A. Yes, sir, that is true.

Q. In moving along, Mr. Kelley, I note that you say at Page 8 of your statement that "the switching at Wynne is done in the south part of the north yard and there is a crossing which must be protected in that part of the yard". Can't this switching be done in the north part of the yard at Wynne? A. It would not be practical.

Q. Why would it not be practical to do the switching in the north part of the yard at Wynne? A. Because of the way the tracks are situated and because it would take more time.

Q. But if it were decided to take the additional time, it could be done in the north part of the yard at Wynne, couldn't it, Mr. Kelley? A. If you had the track room, it could be done from either end.

Q. There isn't any crossing to protect in the north part of the yard at Wynne, is there, Mr. Kelley? A. There is no crossing to protect in the north part of the north yard at Wynne.

Q. There is one reference at Page 9 of your statement, Mr. Kelley, which I thought might be a typographical

error. In reference to switching the Halstead Copper Plant the first full paragraph on that page you say "at times two cars have to be spotted inside the building and in order to do this it is necessary that all the men position themselves in order to pass signals to the engine crew". Did you mean to say that in order to spot two cars you need four men working the movement, Mr. Kelley? A. No, sir, I did not say that we needed four men.

Q. Isn't that what you have at that point, the conductor and three brakemen? A. Usually in spotting this plant there will be three brakemen. The foreman usually is not with us when we spot this plant.

Q. You mean the conductor? A. Yes, sir.

Q. Mr. Kelley, your experience included some work in steam as well as in diesel service, did it not? A. Yes, sir.

Q. When you first started working in freight service or in yard service on the Missouri Pacific, what type of hand brakes were customarily installed on the cars? A. We had a number of Ajax hand brakes. We had a number of what we referred to as stem winding hand brakes.

Q. The stem winder has also been referred to as the staff type brake, has it not, Mr. Kelley? A. Yes, sir, that is true.

Q. And wasn't it customary for a brakeman who was required to set that type of hand brake to carry a staff in order to assist them in the process of setting the brake? A. I have not in my career carried a staff.

Q. But you agree to me that a stem-winder or a staff brake was an extremely hard brake to set? A. Yes, it was.

Q. And do you also agree that the newer type of hand brake is much easier to set? A. The Ajax hand brake is much easier and much safer than the staff brake that you referred to.

Q. When you first started working in road freight service, did the trains on which you worked handle some L. C. L. traffic? A. Yes, sir, that is true.

Q. Was it customary for the trains handling such traffic to stop at one or more places for the purpose of unloading the L. C. L. traffic? A. That is true.

Q. How many stops on a single trip would a train in local service handling L. C. L. traffic make based on your experience, Mr. Kelley? A. In handling L. C. L. freight the train would stop at any station where he had freight to unload.

Q. Who unloaded the L. C. L. freight at those stations? A. The train crew.

Q. Did the entire train crew participate in that unloading or just certain members of the crew? The brakemen would unload the mechandise.

Q. Was it sometimes the practice where L. C. L. was unloaded for part of the crew to unload the L. C. L. while other members of the crew conducted switching operations at that same station? A. At times in order to expedite the movement of the train, this would be practical.

Q. On some occasions did the L. C. L. that required unloading consist of bales of cotton? A. I have never unloaded bales of cotton.

Q. Have you observed any other train crews unloading bales of cotton? A. I have not.

Q. Did I misstate the matter? Were you loading bales of cotton at any of these stops? A. No, sir. We haven't handled or I haven't handled nor have I observed anyone handling bales of cotton since I have been employed on the railroad.

Q. Are you familiar with—— A. Let me say that I don't recall this. I don't remember if it has been done.

Q. Are you familiar with the traveling switch engine that has been working your territory between Wynne and Forrest City? A. I have not worked this traveling switch engine.

Q. Do you know that there is such an assignment working in your territory? A. Yes, sir.

Q. Do you know what the consist of the crew on that assignment was when it was established? A. Yes, sir.

Q. What was it, Mr. Kelley? A. The consist of the crew was an engineer, a fireman, a conductor and three brakemen.

Q. Are you sure that three brakemen were used on that assignment when it was first established, Mr. Kelley? A. The best I can remember there was a conductor and three brakemen on this assignment when it was first established.

Q. Has this assignment worked with two brakemen since it was established, Mr. Kelley? A. It is now operating, as far as I know, with a conductor and two brakemen.

Q. And this traveling switcher is working doing station switching and other types of switching in the same territory in which you work as a conductor and as a brakeman, isn't that true, Mr. Kelley? A. Yes, sir, that would be true. This train operates Wynne to Marianna and return to Wynne.

Q. Just one additional question. You refer to a stop on the return trip to Wynne at Warwick? Did I understand that? A. Yes, sir, if the occasion arises we will.

Q. Is Warwick in the yard limits? A. No, sir, it is not.

Q. The stop is not made within yard limits at that point? A. Not at Warwick. This is Warwick Electronics Plant located north of Forrest City.

Mr. Light: I have several questions I would like to ask. Would it be all right if I go ahead and ask them to expedite things?

Mr. Ross: No, I had rather Mr. Lucente would do it.

Mr. Light: Mr. Ross, I don't think you have any right to insist on that in a deposition.

Mr. Ross: I think that I do in that at the trial I am sure the Judge will restrict the questions of any one witness to questions by any one attorney and I think the same is true on depositions. I think it might be confusing to have each of you have a go at him and swap back and

forth and I do object. We can put that objection in the record and then if you want to proceed to question him, you may do so.

Mr. Light: With the objection noted, I will proceed.

By Mr. Light: Q. How does the Helena-McGehee local that you are now working compare to the Helena-Wynne local with regard to the amount of switching done enroute? A. They will do any amount of switching that is necessary or that they are required to do between Helena and McGehee.

Q. That doesn't answer my question. Do you do more switching on the Helena-McGehee run or less than you did on the Helena-Wynne run? A. I would say that at times it would be more on one run than it would be on the other run and vice versa but usually at the present time I will say there is more work on the Helena to Wynne turn than there is on the Helena to McGehee local.

Q. There are seasonal differences in the volume of switching on both of those runs? A. That is true.

Q. Is that right? A. Yes, sir.

Q. During harvest season you have a sharp increase in the amount of cars you handle and switching done? A. That is true.

Q. Are there some other times of the year that there is a marked increase in the amount of switching? A. I don't quite understand that. Are there other times of the year what?

Q. Other than the harvest season, are there other times of the year where there is a substantial increase over the normal amount of switching and cars handled? A. At times. I am speaking of the McGehee local.

Q. What times other than harvest season does that occur? A. What I am referring to is the handling of rock at Medina or Vestal. We are not presently handling any rocks for Vestal but we are handling rock for Medina.

Q. Do you have reference to rock handled in connection

with the Arkansas River Navigational Project? A. That is true.

Q. And on occasions the contractors call for large amounts of rock? A. Yes, sir.

Q. And you have an increase in your work? A. Yes, sir.

Q. At page 3 of your testimony you indicate that at Marianna you make an effort not to handle more than seven or eight cars at a time in switching because to exceed that number would require you to pass some signals on the fireman's side. Have I substantially said what you said? A. This would be what you are referring to there would be the actual spotting of the automobile plant at Marianna.

Q. And that is your practice at Marianna? A. To switch the plant?

Q. No, sir, to attempt to handle only seven or eight cars in that process so that you can pass signals from the engineer's side? A. In spotting the plant that is true.

Q. Do you sometimes spot seven or eight cars and then go back and pick up some more cars and spot them also so that the entire process can be carried out with signals being passed on the engineer's side? A. For loading purposes, you can only spot seven cars in this plant.

Q. You mean that is the track capacity? A. That is the loading capacity of the plant. That is all the doors that there is.

Q. I'm not sure that I follow you. What do you do if you have got more than seven cars for delivery to that plant? Do you ever have more than seven cars for delivery to that plant? A. You will have usually several more cars but you can only spot seven cars at the plant for loading or unloading.

Q. What do you do with the balance of the cars? A. We leave them in the track.

Q. Is this something that you do, Mr. Kelley, at other places where you perform switching operations, that is,

limit the number of cars that you handle in any particular movement so that you can pass signals from the engineer's side? A. Usually that is correct. We try to handle what we can best work with.

Q. What is the biggest place of L. C. L. merchandise you ever helped load or unload? A. Actually I don't remember but I would say that it would be, if you are speaking of weight, would be feed, something in that manner.

Q. Sacks of feed? A. Yes, sir.

Q. How is the amount of paper work that you now do as a conductor compared to the paper work that a conductor did when you first went to work for the railroad? A. When I first went to work on the railroad, I didn't have any idea what the conductor's duties was.

Q. Did you ride in the caboose during your early years of working for the railroad? A. At times, yes, sir.

Q. Didn't the conductor ride in the caboose? A. Yes, sir.

Q. Did he do his paper work there in the caboose? A. He was working.

Q. You had an opportunity to observe him? A. I saw him writing, yes, sir.

Q. Isn't it true that the amount of paper work done by a conductor has greatly been reduced since those days early in your railroad career?

Mr. Ross: I believe he said he wasn't familiar with what the conductor did when he first went to work for the railroad and I would object to that question.

By Mr. Light: Q. Answer the question if you can, Mr. Kelley? A. I will say that on the Helena to McGehee local which I am presently operating as a conductor I stay pretty busy writing.

Q. When did you first work as a conductor? A. I don't remember.

Q. Would it be within two or three years after you went to work as a brakeman? A. Possibly.

Q. When you first worked as a conductor, was the wheel report supplied to you at the initial terminal? A. Yes, sir.

Q. You never have prepared your own wheel report at the initial terminal, starting out? A. Not at the initial terminal starting out.

Q. How have your duties changed in connection with the preparation and maintenance of the wheel report since you first became a conductor? A. We have now a different wheel report than what we had when I first performed duty as——

Q. What is the major difference? A. On the new report, the report we are presently working with, we will have to enter in different information than what we did on the old report.

Q. While working as a conductor, Mr. Kelley, do you sometimes participate in actual switching operation? A. Yes, sir, at times.

Q. Of course, conductors are qualified to do that right along with brakemen, are they not? A. I would say that they were qualified.

Q. In a caboose you have a cupola that permits a man to observe forward of the caboose while the train is in motion, don't you? A. Yes, sir.

Q. Is that the duty of one of the men on the caboose to sit in that cupola while the train is in motion and observe forward of the train? A. Yes, sir, that is one of their duties.

Q. When the train is on straight track the view from that cupola is simply a view of the top of the cars ahead of the caboose, isn't that right? A. Well——

Q. To be a little more specific, when the train is moving along straight track, the man sitting in the cupola cannot see the wheels of the freight cars ahead of him? A. He can see a few cars by leaning out the window of the cupola.

Q. Could see the first few cars in front of the caboose by doing that? A. Yes, sir.

Q. Now, when the train enters a curve to the left, the man in the cupola on the left has an opportunity to observe many cars ahead and the wheels of those cars, isn't that

right? A. Yes, sir, that is true. Again he will lean out of the cupola for a better view.

Q. And the same would be true of a right hand curve? That would afford him a view of the wheels of the cars on the right side of the train? A. Yes, sir, that is true.

Q. How many men are needed to sit in the cupola to make that observation? A. Under the conditions that we operate under, there is usually two men in the cupola.

Q. Why? A. If there are two brakemen on the caboose, I would require that they would sit, one on one side and one on the other to observe the train.

Q. If you just had one brakeman on the caboose with you, Mr. Kelley, what would you require him to do? A. I would require in case I was busy for him to lookout and observe the train on both sides.

Q. From the cupola? A. Yes, sir.

Q. And when the train was in a right hand curve, he would position himself on the right side of the cupola, is that right? A. That is true, yes, sir.

Q. And when the train then entered a left hand curve, he would position himself in the left hand side of the cupola? A. That is true, yes, sir.

Q. And you, in fact, have had brakemen do that particular job at times when you just had one brakeman on the caboose with you? A. I have, yes, sir.

* * * *

Redirect Examination,

By Mr. Ross:

Q. Mr. Kelley, in yard service the man in charge of the train crew is referred to as what? A. The authority of the train is invested in the conductor.

Q. All right, is there a distinction in the designation of the conductor as in road service and in yard service? A. Now, what I meant by that is under the jurisdiction of the conductor, the train, the movement of the train, the cars.

Q. Now, this man is referred to as a conductor in road service? A. That is true.

Q. In yard service, he would be referred to as an engine foreman, is that true? A. That is true.

Q. Mr. Kelley, I believe you said on the return trip from Wynne to Helena that usually you did not have a protection order. Was that your statement? A. That is true. Usually we do not have a protection order on the southward trip.

Q. When you do not have a protection order, do you know whether or not there is an extra train or any train on some portion of the track which you are going to occupy? A. You will expect the movement of trains on the main track at any time.

Q. I believe there is a rule to that effect? Isn't that true? A. That is true.

Q. Mr. Kelley, when you were being questioned by I believe Mr. Lucente about the report 2704, I don't believe he mentioned the handle report portion of this 2704. Would you tell us what that is, please, sir? Or is there such a portion to this report? A. There is a portion under the column where you will list the cars handled. You will list the number of loads, the number of empties, the station number from, the net tonnage and the gross ton. Any time you set out or pick up, you break your tonnage and you will again enter this same information.

Q. You have to keep up with the tonnage of all cars that you handle then? A. That is true. And under "Remarks" at the end of the trip——

Q. This is the remarks section of the 2704? A. Yes, sir.

Q. All right? A. At the completion of the trip, you will list a total car handled. This will consist of the total number of loads, the total number of empties, the net tons, the gross tons and the adjusted tonnage of all cars handled on the entire trip.

Q. This is all cars handled between any station? A.

This is all cars handled between any stations on the entire trip.

Q. Mr. Kelley, could you wait until you come to your termination or your final terminal before preparing this handle report? A. Under the column of keeping up with your tonnage and putting this information down, you cannot wait until you get into your terminal to enter this information. Under "remarks", on the total cars handled, you would wait until you arrived at your final terminal to enter this information.

Q. You have to keep a running total or a running account on the tonnage along the way in order to have the proper information to fill out the handle report, the final portion of the handle report when you get to your destination? Is that true? A. That is true, yes.

Q. When were you assigned as conductor on the Helena to McGehee local? A. I cannot say the exact date because I don't remember it. I have been on this job approximately one month.

Q. Prior to that you worked regularly on the Helena to Wynne turn? A. Immediately prior to that, I worked on the Helena to Wynne turn.

Q. And for the major portion of the time, major portion of the last three years, you have been working on this particular turn? A. That is true.

Q. Mr. Kelley, you mentioned the cupola and I believe you said the man leaned out the windows on either side to watch the train. Is that correct? A. That is correct.

Q. Mr. Kelley, what, if you can estimate, what percentage of the time on this Helena to Wynne turn will every car on the train be on straight track? What percentage of time will not at least part of your train be on a curve? A. This train will be on a curve on, the curves. It will be on straight track when you are on straight track. I can't answer that.

Q. Mr. Kelley, are there a lot of curves in this track from Helena to Wynne? A. There are several curves.

Q. Will there be any time that some part of this train will not be on a curve on your trip from Helena to Wynne? A. There will be several times when the train will not be on a curve between Helena and Wynne.

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INTERVENORS' EXHIBIT NO. 24—
Testimony of E. H. Ryan.

My name is E. H. Ryan and I am employed by the St. Louis-San Francisco Railway Company and have been so employed since September 29, 1942. Prior to going to work for the company, I made student trips for approximately thirty days and I was required to pass a test on the book of rules and also a mechanical test before I went to work. In March of 1947, I was promoted to engineer.

I work on the Southern Division of the St. Louis-San Francisco Railway Company and hold seniority from St. Louis, Missouri, to Capellville, Tennessee and all branches. I am presently working in through freight service between Chaffee, Missouri, and Capellville, Tennessee. Capellville is a suburb of Memphis where our yard is located. I am presently working as an engineer in through freight service.

The Frisco track over this territory enters Arkansas approximately seven miles north of Blytheville, Arkansas, and runs to the Mississippi River Bridge at Memphis. There is approximately 72 miles of track located in Arkansas. We have two freight trains that operate in each direction, two north and two south, between Chaffee, Missouri and Capellville, Tennessee. There are also two other trains operating over part of this track in Arkansas. They are the road switcher that operates at Blytheville, Armorel and Osceola and another road switcher that operates out of Blytheville as the Blytheville, Armorel, Marie, Manila road switcher. The road switchers operate six days

a week. There are thus six trains which operate over this track in Arkansas in any twenty-four hour period except Sunday. In through freight service our trains are pulling from 50 to 150 or more cars and the engine consist is usually made up of from three to five units. Usually on trains 835 or 836 the engine consist will be made up of the car body type engine EMD 1500 horsepower, and some of the engines are Alco 1500 horsepower covered car body type engines. Then on trains 833 and 834 we generally have the GP-7 type 1500 horsepower engine and on this train we generally have three or four units depending on the tonnage. Sometimes on the 836 we will have the newer type GP units.

This track in Arkansas is equipped with Centralized Traffic Control with the CTC operator or dispatcher located in Springfield, Missouri. Most of our engines which we operate over this territory are equipped with the dead man pedal type of train stop device. I am not acquainted with the alerter type train stop device and, so far as I know, we have never had any locomotives so equipped on our division in Arkansas. Most of the locomotives and the through freight cabooses are equipped with radio. The through freight cabooses are the newer cabooses which were bought about eight or ten years ago and these are equipped with radios. All the other cabooses, of which Frisco has many, and which are older, are the ones Frisco uses on the locals and on the road switchers and they are not equipped with radios. Many of the radios are not in good working order and many times they are unusable. Most of the switches over this territory are not remotely controlled by the CTC operator. For instance, between Chaffee, Missouri, and Turrell, Arkansas, a distance of approximately 140 miles, we have only four remotely controlled sidings. Over this territory the head brakeman is by rule required to ride in the lead engine of the engine consist while the train is in motion between stations. The

head brakeman, of course, does not ride in the lead unit while we are performing switching operations. Members of the engine crew are not prohibited from moving between units while the train is in motion and we do patrol our engines while the train is in motion. This is true on both the car body type engines and the GP type engines.

I am now operating as an engineer but I am familiar with the duties of a fireman as I operated as a fireman for many years and am familiar with what the fireman does as my helper on the engine crew. On getting on the train at Chaffee, Missouri, the fireman will check the engines to see that there is enough lubricating oil, water, fuel and sand, and that everything else is in proper order. The fireman will also check to see that we have the necessary flags, fusees, torpedoes, monkey wrench, other wrenches, hammers, chains, air hoses, jumper cables, spare knuckles, and other supplies and replacement parts. The fireman will check the lights on the head unit and on the rear to see that they are both in working order. The engineer and fireman together will check the automatic brake. The engineer will be in the cab of the engine and will apply the brakes. The fireman will inspect the brakes to see that they are all setting properly. He will signal the engineer and the engineer will release the brakes and the fireman will again inspect to see that all brakes are properly releasing. This independent brake test takes two enginemen to perform.

As soon after leaving the terminal as conditions will permit the fireman will go back through the engines to make a check to see that they are all working properly. He will particularly check to see that the engines are loading properly and that proper transition is being made. These checks have to be made while the engine is in motion as the malfunctions cannot be determined while the engine is stopped. It is particularly important to make this check after leaving the Chaffee terminal because in

some instances there is no fireman on the engine coming into Chaffee and in many cases they come into Chaffee with a dead engine or an engine not properly loading or not loading at all. It is important to have all engines working, particularly at the Memphis Bridge it takes all engines working properly to get a tonnage train over the bridge because of the grade. The fireman will patrol the engine units from time to time over this run to make sure that everything is working properly.

It is the duty of the engineer to keep a lookout to the front and to the left of the train and also to the rear for any hot boxes, sticking brakes, shifted loads, or any other situation of danger. It is particularly necessary for the fireman to keep a lookout to the front and to the left when approaching crossings as the engineer's view is often limited in that direction and is particularly limited when operating from a GP type engine. Of course, if there are crossings located on curves to the left, the fireman will be able to view the crossing long before it comes into the vision of the engineer. Even on the car body type engines, the engineer's view is restricted to the left immediately ahead of the train because of the inverted V shape of the windshield with the hump of the inverted V being in the middle and obstructing the view of the engineer to the immediate front and left of the engine.

We normally perform switching operations at Luxora, Osceola, Wilson, Delpro, Joiner, Frenchman's Bayou and we usually set out and pick up at Blytheville, Stacy and Harvard. Our switching operations in the fall of the year are particularly heavy because of the harvest season.

At Osceola, Arkansas, we have many industries. Going south at Osceola the switching would be on the fireman's side at the oil mill track when you're switching from the main line or after you move back in the oil mill itself, which is some three-quarters of a mile from the main line. This track is all a long curve back into the oil mill and

the curve would be on the fireman's side if you were headed south. There is no way that the engineer could possibly see any of the brakemen because of the curve. In switching the oil mill track you will have in addition to the three or four engine units from three or four to fifteen or eighteen or possibly twenty cars which we will be shoving. There is also a public crossing here over which switching moves are made. On the return trip going north, the switching at the greeting card plant and the compress would all be on the fireman's side.

In switching the oil mill it is sometimes difficult to pass signals to the engine crew and all four trainmen must spread out. I have seen a member of the train crew get on top of a building in order to pass signals at this oil mill.

In switching the oil mill, the house track, the team track, the compress and greeting card plant, movements are made over public crossings. When cars are shoved over these public crossings, a member of the train crew, by company rule, flags these crossings. When engines are headed over these crossings, it is up to the fireman and engineer to look over these crossings. In backing up over these crossings with the engine consist and with no other cars attached, it is absolutely essential that a fireman be present to watch the crossing on his side of the train. There is no way possible for the engineer to see that side of the crossing. In this situation the trainmen are not required by company rule to flag the crossing.

On a southbound train switching the Y track at Wilson the work is on the fireman's side because of the curvature of the track and we will at times have sixteen to twenty cars to put on this track. At these times it is absolutely necessary to pass signals on the fireman's side. This particular track is approximately a mile long and there are at least three public crossings across this track. Switching will be done over one or more of these crossings, depending on the number of cars to be left and how far back on the track the cars are to be left.

Switching at Wilson is also done on the house track and the soybean mill track, both of which are crossed by public crossings at grade. Both of these tracks are on curves and switching is done on the fireman's side, depending on the number of cars we are handling and whether the train is headed north or south. Thus, many times it would be necessary to pass signals on the fireman's side.

In switching any of these tracks the presence of a fireman is necessary because in many instances the engineer while backing on a track is unable to see the cars to be coupled onto. Often times the fireman will be able to tell him the distance to the coupling, which information will enable the engineer to make a safer coupling. In many instances the trainmen have difficulty getting in a position where you can see them because of the piping around the plant, the buildings and many other obstructions.

At Harvard, Arkansas, we do considerable switching, picking up and setting out. During wheat harvest and soybean harvest we set out wheat and soybeans for inspection. In many instances we set out a great number of cars at this point for southbound trains. If we do set out a considerable amount of cars on a southbound trip at Harvard, the engine will be around a curve where it is impossible for the engineer to see the brakemen. Signals must be passed to the fireman for relay to the engineer in order to make a safe move during this switching.

In Blytheville we regularly set out and pick up and perform some switching and in doing this work we pass over numerous public crossings. As we are shoving cars over these crossings it is necessary for the crossings to be flagged by a trainman. In moving the engine consist back and forth over the public crossings we are not required to flag the crossings. Of course, with three to five engines in the engine consist on these trains it is absolutely necessary to have the fireman present so that he may keep a lookout at the crossings on his side of the train because

it is impossible for the engineer to see both sides of the crossings. In many instances in doing the switching the engine will be stopped a few feet from the crossing. When you are this close to a crossing it is impossible for the engineer to see the left of the crossing on either type engine either because of the long nose on the GP type or because of the hump of the inverted V of the windshield on the carbody type.

On the GP-7 type locomotive and other GP type locomotives, the engineer cannot see from his position in the engineer's seat anything to the left for several hundred feet in front. If the track is straight, the engineer will be able to see a crossing several hundred feet away, but as he neared the crossing, he would lose his view to the left of the crossing. Of course, if the crossing were on the curvature of the track to the left, the engineer would lose sight of that crossing at a greater distance away from the crossing or maybe never see it at all and in switching moves he would be going over the crossing blind if it were not for the fireman. On the car body engines the windshield goes all the way across the front of the engine with the exception of the space taken by the support bar in the middle of the windshield. This support bar is approximately ten inches wide. These windshields are shaped like a sprawling inverted V with the slight hump of the V being located in the middle position of the support bar. From his position in the cab the engineer cannot see immediately in front of the engine to the left. Particularly in switching operations where stops are often made at public crossings it is necessary for the fireman to be present to stand up in the middle of the cab in order to get a clear view of the crossing. In these situations it is often necessary for the engineer to be watching to the rear of the train in order to get signals from the trainmen for the moves or stops. On the car body type engines there is no window to the rear of the locomotive and it

is necessary for the engineer to get his head outside the side window in order to watch to the rear and then he can see only on his side of the train.

The run from Chaffee, Missouri to Capellville, Tennessee, takes approximately six and one-half to sixteen or more hours, depending on the amount of switching to be done and the delay because of any equipment failure. I, as an engineer, often call on the fireman to relieve me. The fireman is the only other person on the train who is qualified to run the engines.

I have operated as a fireman on steam freight service and have operated stoker fired steam locomotives, fuel oil fired steam locomotives, and the hand fired steam locomotive. The fireman was required then, as now, to perform his work in a manner so that he would be available to keep a lookout on the left side of the train at all times when it is necessary.

At all times on the stoker fired steam engine or the oil fuel fired steam engine I would be in my position on the left side of the cab approximately 99% of the time as I did not have to shovel any coal. On stoker fired and fuel oil fired locomotives the fireman had to keep a watch over the steam gauge and water level gauge. This could be done from the fireman's position in the cab of the steam locomotive. On the oil fired steam locomotive the fireman was required to shovel sand into the firebox once every twenty miles or so, depending on the condition of the engine. This had to be done in order to get the soot out of the firebox. This operation took very little of the fireman's time. On the hand fired steam engine the fireman would arrange his stoking operations so that he would be available to look out on the left side at any points where it was necessary, such as when approaching street crossings, curves, going through towns or when passing order boards or any situation of danger or potential danger. I would say that in these situations the fireman was avail-

able approximately 100% of the time to perform the lookout function.

When we had steam engines the trains were much shorter and we had much less tonnage than we do now with the diesel engines because the diesel engines are more powerful and, of course, we operate with more than one engine in the consist. When we are operating a steam engine, the maximum tonnage we could pull over the Mississippi River at the Memphis Bridge was approximately 2,650 tons. With a five unit diesel engine consist we can handle 10,000 tons. In addition to that the cars are much longer today than they were in the steam engine days. During the steam engine days most cars were forty feet in length. Today most of the cars are longer than forty feet, and a lot of them are eighty to eighty-nine feet. A full safety crew of six men is necessary to man these trains.

I, as an engineer, am especially aware of the contribution that the fireman makes to the safety of the operation of the train. Of course, we keep no records of the number of instances in which a fireman prevents an accident as records are kept only in those instances where an accident does occur. In many instances the fireman has called my attention to a condition which I was not aware of. Of course, this is done routinely as a part of the fireman's job and no record is kept of it, but as can be seen from the instances and conditions which I have described, it is necessary for the fireman to be present for the safe operation of the train. Although the ultimate responsibility for the safe operation of the train is the engineer's, it is also the responsibility of the fireman to see that the train is operated safely.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 24—

Cross-Examination,

By Mr. Light:

Q. State your name and address, please sir? A. E. H. Ryan, highway 77, Chaffee, Missouri.

Q. What is your union affiliation? A. Brotherhood of Locomotive Firemen and Enginemen.

Q. What official position do you hold with that organization? A. Chairman of the Local Grievance Committee.

Q. Mr. Ryan, I direct your attention to page 3 of your testimony where you describe the activities of the engineer and firemen when they go on duty at Chaffee, Missouri, in preparation for taking the train south. This would be train No. 833 or 835 which is the southbound train. Is that correct? A. Yes, sir.

Q. Is it true that when that train arrives at Chaffee, it pulls down the main line to Yoakum Avenue and the outbound crew gets off or rather the inbound crew gets off and the outbound crew gets on and the train leaves within a two or three minute period? A. No, sir, it is not. Part of it is true and part of it is not.

Q. Tell me what is not correct? A. In the first place, it generally does not leave in two or three minutes. In the second place, we sometimes change crews at Yoakum Avenue and we sometimes get the engine from the tie-up track.

Q. When you change crews at Yoakum Avenue, have you had the experience of leaving within two or three minutes after the outbound crew or rather after the inbound crew has stopped the train? A. Possibly one percent of the time or less.

Q. What would you say your average time is after the inbound crew has left the train until you take it on south? A. Well, that would be hard to answer because it runs all the way from a few minutes to an hour and possibly more.

Q. You couldn't give me any average? A. I don't know how I could possibly give you an average because train 833 generally switches and makes up his train in the yard before he departs Chaffee.

Q. What size crew is it that brings this train from St. Louis to Chaffee? A. Well, sometimes they have an engineer, a fireman, a conductor and two brakemen. There is times they only have an engineer, a conductor and two brakemen.

Q. Sometimes it is a four man crew and sometimes it is a five man crew? A. Yes, sir.

Q. And, of course, those instances in which it is a four man crew have all occurred since the Arbitration Award of Board No. 282? A. Yes, sir.

Q. Have you ever known of that train failing to get to Chaffee from St. Louis while it had a four man crew? A. Well, they have derailments and such as that that delays the train from a few hours to seven or eight hours at times and such as that. They have, at times they have brake trouble or something like that that they have a considerable delay.

Q. I am not talking about delays. I am talking about the train leaving the terminal at St. Louis and whether or not it has always arrived at Chaffee, whether it had five men or four men on it? A. As far as I know it has always arrived.

Q. What are the instructions to the train crew for action if they encounter mechanical malfunctions on the diesel unit? A. Do you mean the engineer and fireman?

Q. Yes, sir? A. Well, they correct the trouble when possible.

Q. Do you also have instructions to throw off a message at an open agency so that that information can be passed on to the next terminal? A. Yes, sir.

Q. Has train No. 833 and 835 ever been held up to your observation there at Chaffee while the mechanical

forces did mechanical work on the locomotive? A. Yes, sir, many times.

Q. And on occasions has that been as a result of prior information that they have received from the crew bringing the train from St. Louis to Chaffee that they were encountering mechanical difficulty? A. Well, in some instances but I don't think we have but one open telegraph station and at this time I am not working on the St. Louis sub that is between St. Louis and Chaffee and so I couldn't say personally how many open telegraph stations they have at night but I don't believe they have but one.

Q. You have worked on that subdivision though, haven't you? A. Yes, sir, many times.

Q. In the past two years, has the main reservoir pipe between the air compressor and the main reservoir ever broken on a train that you were a member of the train crew, on which you were a member of the engine crew between Chaffee and Memphis? A. No, sir.

Q. Would you know how to correct that problem if it occurred? A. Well, I think I would know.

Q. What would you do? A. Well, in my opinion you would close the main reservoir cut-out cocks at each end of the unit.

Q. Is that all? A. I'm not too familiar with this because such as things like this happen and maybe they won't occur again for years and you forget about them.

Q. That is really the sort of malfunction that the mechanical forces take care of, isn't it, Mr. Ryan? A. Yes, sir.

Q. I direct your attention to the last paragraph on page 4 where you describe switching operations that you usually do at several locations. Have you found that testimony? A. Yes, sir.

Q. Are you intending by that testimony to describe the switching operations conducted by Train No. 836 from

Memphis to Chaffee? A. Most of the switching is performed by trains 833 and 834.

Q. In fact, train 836 is a through train from Memphis to Chaffee and does not switching between those points, isn't that true? A. That is not correct.

Q. Tell me what is incorrect about it? A. Well, we set-out and pick-up and in some instances do switching but not often.

Q. Tell me at what point you set-out and pick-up on train 836 between Memphis and Chaffee?

Mr. Ross: Is that the train you have just been talking about?

Mr. Light: It is the one I am talking about. Is it the one you are talking about?

The Witness: We can talk about either one you want to talk about but on train 836 sometimes they set-out and pick-up and sometimes they do not.

By Mr. Light: Q. Where? A. It could be at any point. Sikeston is one point where they pick-up a piggy-back car.

Q. How frequently do you have occasion to do any switching on 836? A. That would be hard to answer because in the first place I do not work that train all the time.

Q. Isn't it pretty much of a rarity, Mr. Ryan, for 836 to do any switching between Memphis and Chaffee? A. Well, I wouldn't call it rare because he does switch.

Q. How many times have you worked 836 in the last year roughly? A. Well, on the average I would work 836 a fourth of the days I work in a year and last year I worked two hundred and six days.

Q. So, we are talking about approximately fifty trips on 836. Is that correct? A. That would be pretty close.

Q. Now, of those fifty trips approximately how many of them involved switching between Memphis and Chaffee? A. I wouldn't have any idea because I don't remember.

Q. It would be less than half of them, wouldn't it? A. Yes, sir.

Q. Now, do you also work Train No. 835 approximately one fourth of your number of trips? A. Yes, sir.

Q. Is it correct that that is a through train from Chaffee to Memphis and does not perform switching operations between those two points? A. 835 nearly always sets-out at one or more points between Chaffee and Memphis.

Q. Are cars added to 835 at Chaffee? A. Most of the time they are.

Q. That is done by the station forces there, is it not? A. Yes, sir, and the cars are added on the rear of the train.

Q. That does not require any participation from the train crew on 835, does it? A. Nothing except when they do switch the head of the train the crew is naturally on the engine and they have to hold the deadman pedal down to release the brake in order for the yard engine to handle 835's engine.

Q. Is it true that Train No. 833 between Chaffee and Memphis consigns any switching to straight set-outs and pick-ups and does not do station switching? A. 833 does do station switching.

Q. At what point? A. It might be at anyone of the numerous stations.

Q. I see, Mr. Ryan, you are referring to notes of some sort on a yellow pad. May I inquire what notes those are? A. I have a list of the stations from the Arkansas State line to Harvard which is the last point where we set-out or pick-up between Chaffee and Memphis.

Q. Are you familiar with the additional local switcher that is placed in service during the Fall Harvest Season that is called the Harvard turn? A. I don't know of any such job.

Q. So, if there is a train called "The Harvard Turn" that carries on the switching operations between Chaffee,

Missouri, and Harvard, Arkansas, during the Fall Harvest Season, you are unaware of it? A. There is no such train because I would be aware of it if they had a train on. I could explain that a little bit if you would like for me to.

Q. Briefly tell me what you mean? A. Pool freight crews are used to operate this Harvard turn that you are talking about.

Q. I understood you just to testify that there was no such train? A. There is no such regular train but when they do operate the Harvard turn which might be today or tomorrow or any day, there is no regularly assigned Harvard turn and there hasn't been to my knowledge in a good many years but when they do operate a Harvard turn, they use through freight crews.

Q. You referred in your testimony to the switching operation at the Osceola Oil Mill. Is there a signal system installed by your railroad company there at that facility? A. What do you mean by "signal system"?

Q. I mean a device to assist the train crews in conduction switching operations at that facility? A. No, sir. Osceloa is in C. T. C. territory.

Q. I believe you testified that it was impossible to pass signals on the engineer's side at the Osceola Oil Mill. Is that correct? A. No, sir. It would depend on which way the engine was turned.

Q. If it is turned one way, then you would naturally pass them from the engineer's side? A. Right. The work would all be on the engineer's side.

Q. If it were turned the other way, it would be more convenient to pass them from the fireman's side. Is that correct? A. Yes, sir.

Q. Now, is there anything to prevent you from turning the locomotive so that you could always pass them from the engineer's side? A. Well, many times the jobs that switches Osceola there is only one unit and there is no place to turn a unit at Osceola. In fact, there is no

place to turn an engine between Hayti, Missouri, and Turrell, Arkansas. I will take that back. It could be turned at Blytheville.

Q. On your southbound train from Chaffee, do you ever make any pick-ups? A. On train 833 we always pick-up and set-out.

Q. You are not familiar with any change in the labor agreements that would prevent southbound crews from making pick-ups? A. There is none.

Q. On the northbound trains into Chaffee, do you ever make set-outs? A. Yes, sir, always on 834 and sometimes on 836.

Q. Mr. Ryan, you give some testimony to the effect that it is useful to have a fireman because of his ability to relieve the engineer at times and operate the locomotive. Is that correct? A. Yes, sir.

Q. Are all firemen on your railroad permitted to do this? A. Yes, sir.

Q. Is there not a minimum amount of experience as a fireman required before he's permitted to relieve the engineer? A. Yes, sir.

Q. What is that time? A. I believe it's two years.

Q. Do you ever have a fireman working on a locomotive where you have an engineer who has had less than two years experience? A. Oh, I have had.

Q. So, in those instances, he is not able to relieve you? A. No, sir.

Q. What does he do with his time in those two years before he is permitted to relieve the engineer? A. Well, he has many other duties such as lookout duties and patrol the engine room for trouble, correct malfunctions, take signals from his side from the brakemen on the ground, many other duties.

Q. Does a head brakeman ride in the leading unit of freight trains between terminals on your railroad? A. Except when we are switching.

Q. What does he do with his time while the train is in motion on the road? A. Well, he looks the trains over around curves and on straight track he is a looking ahead.

Q. Now, in the past I believe you said you have operated as an engineman between Chaffee and St. Louis? A. Yes, sir.

Q. About how long ago was that? A. Well, I have been on a regular assigned job between Chaffee and Capleville, Tennessee, for approximately four and a half years. Before that for five or six or seven years or so I was on the engineer's extra boards and I worked all jobs in all directions.

Q. So during that period of five or six years you would have worked frequently between St. Louis and Chaffee? A. Yes, sir, many times.

Q. As a fireman or an engineer? A. Both.

Q. On through freight service? A. Both through freight, passenger and local freight.

Q. What size crews did you have on your through freight from St. Louis to Chaffee at that time? A. At that time we had an engineer, a fireman, a conductor and two brakemen.

Q. And that crew would bring the train from St. Louis to Chaffee? A. Yes, sir.

Q. Then, what size crew would take it from Chaffee on to Memphis? A. Well, from Chaffee to Hayti, Missouri they had an engineer, a fireman, a conductor and two brakemen. They picked up what they called the Arkansas third brakeman at Hayti.

Q. Did they also call him the law-man? A. Well, we don't.

Q. You have heard that expression, have you not? A. Well, I probably have.

Q. You call him the Arkansas third brakeman? A. Yes, sir.

Q. Is that the terminology generally used on the Frisco in this connection? A. Yes, sir.

* * * *

Redirect Examination,

By Mr. Lessenberry:

Q. In looking at your statement, Mr. Ryan, I see on Page 2 the first or beginning paragraph you refer that you are not acquainted with the alerter pipe train stop device. Is that device also referred to as a Vapor alerter? A. I don't know anything about it.

Q. Are you familiar with how it is supposed to act? A. No, sir.

Q. You also state in that same paragraph that engines on which you operate are equipped with deadman pedal. Is this correct? A. Yes, sir.

Q. Have you ever had any personal experience or have you ever had any personal knowledge of any experience where the deadman pedal did not operate as it is intended to operate when the engineer became incapacitated? A. Yes, sir.

Q. When was this? A. On May the 19th, 1965 engineer Earl Ray, Chaffee, Missouri, died instantly while running passenger train 808 at sixty miles per hour and he did not take his foot off of the deadman pedal.

Q. The train continued to run? A. Yes, sir, until the fireman set the brake and stopped the train.

Q. Do you know of any other instances? A. I know of another instance where the engineer become incapacitated but in this instance it was December the 15th, 1962, engineer R. A. Andrews, Chaffee, Missouri become incapacitated while handling passenger train No. 808 while running sixty miles per hour approximately four miles south of Blytheville, Arkansas. The fireman took over the controls and handled the passenger train into Blytheville,

Arkansas where an ambulance was called and taken Mr. Andrews to a hospital and another engineer was called to operate train 808, Blytheville to Chaffee, Missouri.

Q. I take it from reading your statement and hearing your testimony here that you have operated a train through the City of Blytheville. Is that correct? A. Yes, sir.

Q. Is this part of the Frisco main line? A. Yes, sir.

Q. Do the tracks go through the City limits of Blytheville? A. Yes, sir, right through the main business district.

Q. Does it cross Main Street there? A. Yes, sir.

Q. Is that a single track? A. Yes, sir.

Q. Are there any switching tracks on either side of the main line? A. Yes, sir.

Q. At the Main Street in Blytheville, how many sets of tracks are there that motor vehicle and pedestrian traffic cross? A. There are only two at Main Street and that would be the main track and the team track.

Q. Is that particular intersection or public crossing protected by an automatic signal device? A. Part of the street crossings are protected by blinking lights and part of them are not.

Q. Does the Frisco serve the Blytheville Air Force Base? A. No, sir.

Q. Does it connect with it by spur tracks? A. Not the Frisco. The Cotton Belt serves the Air Base.

Q. Is there an interchange there? A. Yes, sir.

Q. Do you handle freight designated for the Blytheville Air Force Base? A. I wouldn't know.

Q. As you go further south into Arkansas from Missouri, you mentioned the town of Osceola? A. Yes, sir.

Q. Does your main line track enter the City limits of Osceola? A. Yes, sir, it goes right through the main business distict of Osceola.

Q. That area of Arkansas is flat Delta country, is it not? A. Yes, sir.

Q. Other than the interstate highway system which has recently been put through there, are there many over or under passes for motor vehicle and pedestrian traffic? A. No, sir. Old highway 61 about three miles north of Blytheville and the interstate 55 approximately a mile south of Blytheville is the only ones I know of in that part of the country.

Q. That have overpasses? A. That have a overpass.

Q. Now, I further read your statement. You mentioned various communities in Arkansas where you perform switching operations and this is on Page 4, at Luxora, Osceola, "Wilson and some other towns there?" A. Yes, sir.

Q. Where do your railroad tracks pass in relation to the city limits and business districts of those towns? A. I don't exactly understand your question.

Q. At Wilson, Arkansas, where is your main line railroad track in relation to the business district of Wilson? A. It goes right through the main part of town.

Q. All right, now, I will ask you if that is generally true or if that is not true of the other towns you have mentioned here in your statement? A. Most all of them the railroad track goes right through the main part of town.

* * * *

By Mr. Ross: Q. Mr. Ryan, you mentioned that this track was governed by C. T. C. territory, that is, the main line track from Chaffee to the Capleville yard? A. Yes, sir, it's governed by C. T. C. from a dispatcher in Springfield, Missouri.

Q. Are all the siding switches automatically controlled by the C. T. C. operator? A. We only have four sidings with power switches that are controlled by the C. T. C. dispatcher. Most of the other sidings do have electric lock on the switch but they are hand operated switches.

Q. Would the C. T. C. operator have to unlock those switches? A. No, sir.

Q. These are unlocked by the crewmen? A. When the engine reaches a point, I believe it is two rail lengths from the switch it activates the lock to where it can be opened.

Q. The movement of the train unlocks the switch then? A. Yes, sir.

Q. And then the switch has to be thrown manually? A. Yes, sir, by hand.

* * * *

Recross-Examination,

By Mr. Light:

Q. If a train is about to enter the main line which is controlled by C. T. C. through one of these switches you and Mr. Ross have just been discussing, do you need to get the permission of the dispatcher before entering that territory he controls? A. You must get permission from the dispatcher either by a leave siding indicator or by communicating with the dispatcher by telephone.

Q. Mr. Ryan, this incident that happened I believe you said in May of 1965 where an engineer died while operating his train? A. Yes, sir.

Q. Is that the correct date? A. May 19, 1965.

Q. What happened there? Do I understand your testimony to be that he remained in his seat and his foot remained with the weight on the deadman's pedal and the fireman had to take him out of the seat? Is that correct? A. That is correct.

Q. Was there a head brakeman in the leading cab of that locomotive? A. No, sir.

Q. Where did this occur? A. The train was stopped by the fireman at mile post T59.

Q. And what town or city is this near? A. It would be nineteen miles south of Crystal City, six miles north of Ste. Genevieve.

Q. Is it in Missouri? A. Yes, sir.

Q. Do you know why there was not a brakeman riding in the cab of that locomotive? A. Because it was a passenger train and there is no brakeman riding in the cab of a Frisco passenger train.

Q. In order to give me the location where the fireman stopped the train, I see you referred to a typewritten instrument. Will you tell me what that instrument is? A. That is the fireman's statement to superintendent Wait of the River Division of the Frisco Railroad.

Q. Were you personally present when this incident occurred? A. I was not.

Q. Your testimony is entirely based upon what someone else has told you in this regard? A. Yes, sir. It is on the report of the fireman.

Q. Did you obtain that through your labor organization? A. Well, the fireman gave me a copy of his report to the division superintendent.

Q. Now, I noticed at the time you were describing this incident to Mr. Lessenberry that he asked you about it, the engineer dying and his foot remaining on the deadman's pedal? A. Yes, sir.

Q. That you appeared to be reading from a yellow sheet in front of you. Am I correct? A. Yes, sir.

Q. I also notice that when you described the incident that occurred on December 13, 1962 you also appeared to be reading from the yellow sheet. Is that correct? A. Yes, sir.

Q. Were you present when the fireman took the controls on that occasion, December 16, 1962? A. No, sir.

Q. Your testimony pertaining to that incident is based solely on something someone has told you? A. It is but there is the record. The Frisco Railroad has a record of it.

Q. And that incident on December 16, 1962, the engineer did not die; is that correct? A. That is correct. He is still living but he never was able to return to work.

Q. Well, in what way did he become incapacitated? Did

he become unconscious? A. Partially paralyzed as I understood it.

Q. Was that a passenger train also? A. Yes, sir.

Q. Did he remain in the seat and keep the deadman's pedal depressed after becoming incapacitated? A. Yes, sir.

* * * *

Re-Redirect Examination,

By Mr. Ross:

Q. Mr. Ryan, is a copy of the report to the division superintendent to which you referred records which are made and kept by the fireman in the normal course of his duties on the Frisco Railroad? A. Not necessarily, no, sir.

Q. These are not reports which are normally made in the course of a fireman's duties? A. Well, this—

Mr. Light: I object on the ground that this is leading and he has already responded to that question.

Mr. Lessenberry: Mr. Light, I think you waived all of your objections when you went into it.

By Mr. Ross: Q. Mr. Ryan, is one of the duties of the fireman or engineer the reporting of accidents or injuries to crew members? A. Yes, sir. We are required to report any accident of any nature and we have regular reports.

Q. Is the report to which you referred such a report? A. No, sir, it is an entirely separate report to the division superintendent.

Q. Is this a report which is required by the division superintendent? A. It's my understanding that in this incident it was required by the division superintendent.

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INTERVENORS' EXHIBIT NO. 25—
Testimony of Raymond Ballard.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 25—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 26—
Testimony of Elvin C. Kerby.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 26—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 27—
Testimony of D. W. Hefner.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 27—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 29—
Testimony of Bernard Meyers.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 29—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 30—
Testimony of P. R. Marcom.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 30—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 31—
Testimony of William M. Chrisman, Jr.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 31—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 32—
Testimony of M. N. Williams.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 32—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 33—
Testimony of J. H. Green, Jr.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 33—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 34—
Testimony of Lloyd C. Burrow

PLAINTIFFS' REBUTTAL EXHIBIT NO. 34—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 35—
Testimony of D. E. Wallace.

PLAINTIFFS' REBUTTAL EXHIBIT NO. 35—
Cross-Examination.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 36—**Uniform Code of Operating Rules.**

INTERVENORS' EXHIBIT NO. 37—**Time Table.**

INTERVENORS' EXHIBIT NO. 38—**Examinations.**

INTERVENORS' EXHIBIT NO. 39—**Photograph.**

INTERVENORS' EXHIBIT NO. 40—**Photograph.**

INTERVENORS' EXHIBIT NO. 41—**Photograph.**

INTERVENORS' EXHIBIT NO. 42—**Interstate Commerce Commission Publications.**

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 43—Table.

Locomotive and Motor Train Miles, Gross Ton Miles and Total Employment

United States Railways, 1961-1965

Year	Locomotive and Motor Train Miles (All U. S. Railways) (Millions) Number	Index	Gross Ton Miles (Class I Line-Haul Railways) (Billions) Number	Index	Total Employment (Class I Line-Haul Railways) (Thousands) Number	Index
1961	883	100.0	1,629	100.0	718	100.0
1962	895	101.4	1,680	108.7	700	97.5
1963	900	101.9	1,721	111.2	680	94.6
1964	918	104.0	1,784	115.4	665	92.5
1965	930	105.3	1,836	118.7	640	89.1

Source: Interstate Commerce Commission, Statements M-400, Statements M-300, and Transport Statistics.

INTERVENORS' EXHIBIT NO. 44—Interstate Commerce Commission Report Excerpts.

INTERVENORS' EXHIBIT NO. 45—Interstate Commerce Commission Report Excerpts.

INTERVENORS' EXHIBIT NO. 46—Interstate Commerce Commission Report.

INTERVENORS' EXHIBIT NO. 47—Interstate Commerce Commission Report.

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 48—Tables.

Selected Statistics From Reports of Bureau of Locomotive Inspection and the Bureau of Safety Interstate Commerce Commission
Percent of Freight Cars Found With Defective Safety Appliances
1931-1940 and 1955-1965

Fiscal Year Ended June 30	All U. S. Railroads	Class I Railroads With Mileage In Arkansas*
1931	1.9%	2.4%
1932	1.8	2.6
1933	2.1	3.3
1934	2.5	3.3
1935	2.3	3.1
1936	2.4	2.8
1937	2.3	2.6
1938	2.4	2.6
1939	2.5	3.1
1940	2.5	2.6
1955	4.6	5.7
1956	5.3	6.5
1957	5.7	6.5
1958	5.0	6.0
1959	4.8	5.5
1960	5.4	5.6
1961	5.1	5.3
1962	5.9	5.6
1963	6.3	6.7
1964	6.7	6.9
1965	7.2	6.9

Source of Basic Data: Annual Reports of the Section of Railroad Safety, Bureau of Railroad Safety and Service of the Interstate Commerce Commission.

* Includes the lines that now form the present Class I Line-Haul Railroads with mileage in Arkansas.

* * * *

CONDITION OF SAFETY APPLIANCES ON FREIGHT CARS INSPECTED

DURING THE FISCAL YEAR 1965

CLASS I LINE-HAUL RAILROADS WITH MILEAGE IN ARKANSAS

Railroad	Total Inspected	Total Defective	Per Cent Defective
Chicago, Rock Island & Pacific Railroad Co.	30,640	2,093	6.8%
Kansas City Southern Railway Company	4,935	448	9.1
Louisiana & Arkansas Railway Company	3,044	318	10.4
Missouri Pacific Railroad Company	33,655	2,204	6.5
St. Louis-San Francisco Railway Company	18,011	1,195	6.6
St. Louis Southwestern Railway Company	3,591	198	5.5
Texas & Pacific Railway Company	8,489	578	6.8
Total	102,365	7,034	6.9
All United States Railroads	1,371,855	99,231	7.2

Source: Report of the Section of Railroad Safety, Bureau of Railroad Safety and Service of the Interstate Commerce Commission, for the fiscal year ended June 30, 1965.

PER CENT, DEFECTIVE LOCOMOTIVES

ALL UNITED STATES RAILROADS

AND CLASS I LINE-HAUL RAILROADS IN ARKANSAS

1930 - 1940 and 1955 - 1965

Year Ended June 30	Percentage of Locomotives Found Defective: All U. S. Railroads	Arkansas Railroads
	Steam Locomotives	
1930	16.2%	10.0%
1931	10.2	6.4
1932	8.0	6.0
1933	9.6	7.5
1934	11.9	7.7
1935	11.8	11.0
1936	11.8	7.8
1937	12.4	10.0
1938	10.5	9.5
1939	8.6	7.7
1940	8.4	7.9
Eleven-year average	10.9	8.3
	All Locomotives	
1955	10.1	10.9
1956	11.4	13.2
1957	9.8	12.6
1958	8.8	13.0
1959	10.4	13.3
1960	10.2	12.7
1961	9.6	10.7
1962	9.6	11.6
1963	10.7	11.2
1964	11.1	11.5
1965	12.3	10.8
Eleven-year average	10.4	12.0

Source of Basic Data: Annual Reports of the Section of Railroad Safety, Bureau of Railroad Safety and Service of the Interstate Commerce Commission.

INTERVENORS' EXHIBIT NO. 49—**Tables.**

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 50—**Tables.**

Railroad Collisions

1961-1965

* * * *

Train and Train-Service Accidents by Broad Cause
Twelve Months Ended December, 1965

Broad Cause	Number of Accidents	Percent
Negligence of employees ...	1,794	7.86%
Defects in or failures of equipment	2,251	9.86
Defects in or improper maintenance of way and structures	1,285	5.63
Miscellaneous	17,501	76.65
Total	22,831	100.00

Source: Interstate Commerce Commission, **Statement M-400.**

* * * *

ALL TRAIN ACCIDENTS AND COLLISIONS

BY BROAD GENERAL CAUSES

1964

	All Train Accidents		Collisions	
	Number	Per Cent Of Total	Number	Per Cent Of Total
Employee Error	1,571	29.5%	1,107	90.0%
Equipment Failure	1,670	31.4	60	4.9
Roadway Defect	855	16.1	12	1.0
Miscellaneous	1,221	23.0	50	4.1
Total	5,317	100.0	1,229	100.0

Source: Interstate Commerce Commission, Accident Bulletin, 1964.

NUMBER OF COLLISIONS, ALL UNITED STATES RAILROADS

1961 - 1966

Month	1961	1962	1963	Average 3 Years	1964	1965	1966
January	61	86	91	79	76	108	84
February	71	89	77	79	89	115	108
March	84	76	86	82	95	110	136
April	76	83	90	83	99	83	127
May	84	82	72	79	104	105	136
June	65	89	103	86	98	123	137
July	85	66	86	79	120	96	
August	90	86	104	93	125	113	
September	87	79	87	84	97	114	
October	106	82	109	99	109	140	
November	92	83	97	91	116	132	
December	81	98	88	89	101	141	
Average First 4 Months	73	84	86	81	90	104	114
Average Last 8 Months	86	83	93	87	109	121	
Average 12 Months	82	83	91	85		115	

Source of Basic Data: Interstate Commerce Commission, Statement M-400.

COLLISION ACCIDENT RATE, COLLISIONS PER MILLION LOCOMOTIVE AND MOTOR TRAIN-MILES*

ALL UNITED STATES RAILROADS

1961 - 1966

Month	1961	1962	1963	Average 3 Years	1964	1965	1966
January	.82	1.10	1.20	1.04	.98	1.39	1.06
February	1.03	1.25	1.09	1.12	1.20	1.59	1.46
March	1.09	.95	1.10	1.05	1.20	1.35	1.66
April	1.03	1.09	1.18	1.10	1.29	1.06	1.63
May	1.08	1.04	.91	1.01	1.31	1.31	1.66
June	.85	1.16	1.34	1.12	1.25	1.56	1.69
July	1.11	.87	1.12	1.03	1.53	1.22	
August	1.14	1.10	1.33	1.19	1.59	1.42	
September	1.16	1.09	1.18	1.14	1.27	1.50	
October	1.33	1.03	1.36	1.24	1.35	1.73	
November	1.20	1.10	1.27	1.19	1.51	1.70	
December	1.04	1.27	1.12	1.14	1.27	1.74	
Average First 4 Months	.99	1.10	1.14	1.08	1.17	1.35	1.45
Average Last 8 Months	1.11	1.08	1.20	1.13	1.39	1.52	
Average 12 Months	1.07	1.09	1.18	1.11		1.46	

*Computed from miles actually run in road service and hours actually worked in yard service by locomotive engineers. Miles and hours for locomotive engineers are reported monthly only for Class I line-haul railroads. Prior to 1965 Class I line-haul railroads employed 91.92% of the total train and engine service employees in the industry (average of years, 1958-1963, with very minor variations from year to year). Beginning in 1965, this ratio was changed to 91.28%, when the relationship of Class I railroads to all railroads was decreased due to a change in the ICC definition of Class I railroads. The locomotive and motor train-miles computed for Class I line-haul railroads were expanded by applying these ratios.

Source of Basic Data: Interstate Commerce Commission, Statements M-300 and M-400.

OPERATIONS WITHOUT FIREMEN AND COLLISION RATE

1961 - 1966

	Percent of Trips Without Firemen 1/	Collision Rate 2/	Total Number Of Trips Index, 1961=100
1961	1.1	1.07	100.0
1962	1.2	1.09	100.8
1963	1.5	1.18	100.7
1964			102.3
1st 4 months	1.6	1.17	
Last 8 months	31.4	1.39	
1965	47.5	1.46	103.3
1966-1st 6 months	52.5	1.53	106.7

1/ Freight and yard service.

2/ Collision accident rate per million locomotive and motor-train miles.

Source of Basic Data: Interstate Commerce Commission, Statements M-300 and M-400, and Transport Statistics in the United States.

* * * *

INTERVENORS' EXHIBIT NO. 51—**Table**

INTERVENORS' EXHIBIT NO. 52—**Table**

INTERVENORS' EXHIBIT NO. 53—**Table**

[Omitted from Appendix.]

INTERVENORS' EXHIBIT NO. 54—**Tables.**

Train Accidents, All United States Railroads

1961-1966

* * * *

NUMBER OF TRAIN ACCIDENTS, ALL UNITED STATES RAILROADS

1961 - 1966

Month	1961	1962	1963	Average 3 Years	1964	1965	1966
January	337	433	466	412	423	523	551
February	340	399	394	378	437	498	560
March	344	392	388	375	412	556	573
April	300	355	349	335	391	465	505
May	326	327	338	330	456	441	609
June	355	346	414	372	450	443	496
July	324	291	374	330	407	429	
August	372	330	409	370	464	512	
September	342	347	368	352	411	486	
October	354	358	392	368	480	538	
November	362	375	435	391	460	523	
December	393	425	493	437	525	553	
Average First 4 Months	330	395	399	375	416	511	547
Average Last 8 Months	354	350	403	369	457	491	
Average 12 Months	346	365	402	371		497	

Source of Basic Data: Interstate Commerce Commission, Statements M-400.

TRAIN ACCIDENT RATE, TRAIN ACCIDENTS PER MILLION LOCOMOTIVE AND MOTOR TRAIN-MILES*

1961 - 1966

Month	1961	1962	1963	Average 3 Years	1964	1965	1966
January	4.53	5.56	6.14	5.41	5.45	6.72	6.97
February	4.91	5.59	5.59	5.36	5.91	6.88	7.59
March	4.48	4.91	4.96	4.78	5.22	6.85	7.00
April	4.08	4.67	4.57	4.44	5.10	5.92	6.48
May	4.21	4.14	4.26	4.20	5.73	5.50	7.42
June	4.63	4.52	5.38	4.84	5.74	5.62	6.12
July	4.23	3.83	4.87	4.31	5.19	5.45	
August	4.70	4.24	5.22	4.72	5.89	6.43	
September	4.55	4.78	4.99	4.77	5.37	6.39	
October	4.43	4.51	4.89	4.61	5.96	6.66	
November	4.72	4.97	5.70	5.13	5.97	6.72	
December	5.03	5.51	6.30	5.61	6.60	6.84	
Average First 4 Months	4.50	5.18	5.32	5.00	5.42	6.59	7.01
Average Last 8 Months	4.56	4.56	5.20	4.77	5.81	6.20	
Average 12 Months	4.54	4.77	5.24	4.85		6.33	

* Computed from miles actually run in road service and hours actually worked in yard service by locomotive engineers. Miles and hours for locomotive engineers are reported monthly only for Class I line-haul railroads. Prior to 1965 Class I line-haul railroads employed 91.92% of the total train and engine service employees in the industry (average of years, 1958-1963, with very minor variations from year to year). Beginning in 1965, this ratio was changed to 91.28%, when the relationship of Class I railroads to all railroads decreased due to a change in the I.C.C. definition of Class I railroads. The locomotive and motor train-miles computed for Class I line-haul railroads were expanded by applying these ratios.

Source of Basic Data: Interstate Commerce Commission, Statements M-300 and M-400, and Transport Statistics in the United States.

PRELIMINARY REPORT OF TRAIN ACCIDENTS

ALL U. S. RAILROADS

1961 - 1966

Year	Number Of Train Accidents	Number Of Locomotive And Motor Train-Miles (000)	Accident Rate 1/
1961	4,141	913,881	4.53
1962	4,358	919,116	4.74
1963	4,736	921,040	5.14
Average: 1961-1963	4,412		4.80
1964	5,146	936,208	5.50
Year Ending April, 1965	5,530	938,901	5.89
1965	5,792	942,732	6.14
1956	6,733	956,132 2/	7.04

1/ Per million locomotive and motor train-miles.

2/ Estimate based on the 1965 ratio of eight months cumulative total to twelve months cumulative total.

Source of basic data: Interstate Commerce Commission, Statement M-450, and monthly Statement M-300.

INTERVENORS' EXHIBIT NO. 55—Table.

MAJOR CAUSES OF INCREASED TRAIN ACCIDENTS

1961 - 1964

Cause	1961	1962	1963	Average 1961-1963	1964
Employee Failures with Respect to:					
Hand Brakes	199	237	275	237	321
Switches	257	286	285	276	366
Miscellaneous*	594	564	704	621	713
Wheel and Axle Defects	780	675	758	738	819
Maintenance of Way and Structure Defects:					
Rails and Joints	327	353	348	343	404
Frogs and Switches	95	123	145	121	188
Other Roadway	137	143	182	154	219

* Operating at excessive speed, enginemen failure to keep proper lookout, improper handling of locomotives, absence of men on leading car being pushed, and other employee failures.

Source: Interstate Commerce Commission, Accident Bulletin, Nos. 130-133.

INTERVENORS' EXHIBIT NO. 56—Table.

IMPORTANT SPECIFIC CAUSES OF INCREASED TRAIN ACCIDENTS

RESULTING FROM EMPLOYEE FAILURES

1961 - 1964

1964 Code No.	Causes	1961	1962	1963	Average 1961-1963	1964
1307	Stop signal, or board disregard of	14	13	13	13	28
1702	Failure to secure by hand brake including failure to set hand brakes on sufficient number of cars	174	204	222	200	272
1802	Switch, improperly set	110	122	130	121	145
1807	Equipment fouling switch	11	10	14	12	56
1808 & 1809	Switch, running through, and derail running off	75	78	78	77	102
1901	Excessive speed or failure to control in yard limits	81	63	41	62	59
1902	Excessive speed in other than yard limits	22	5	12	13	22
1910	Failure of engineman to keep proper lookout, not otherwise classified	66	83	85	78	75
1917	Absence of man on or at leading car being pushed	92	155	188	145	222
	Total of above causes	645	733	783	720	981
	Accident rate per million man-hours in train and engine service, all U.S. railroads	1.59	1.79	1.90	1.76	2.43

Source: Interstate Commerce Commission, Accident Bulletin, Nos. 130-133 and Statement M-300.

INTERVENORS' EXHIBIT NO. 57—Tables.

Railroad Casualties

1961-1966

* * * *

CASUALTIES IN TRAIN OPERATION TO TRAIN AND ENGINE SERVICE EMPLOYEES BY MONTH*

ALL UNITED STATES RAILROADS

1961 - 1966

Month	1961	1962	1963	Average 3 Years	1964	1965	1966
January	894	972	916	927	880	933	902
February	839	949	881	890	805	883	806
March	807	918	854	860	828	900	823
April	748	742	800	763	813	780	775
May	778	827	725	777	919	818	855
June	853	816	872	847	950	879	857
July	902	751	905	853	1,016	938	
August	967	857	941	922	968	971	
September	868	757	909	845	924	855	
October	960	912	934	935	983	901	
November	865	768	849	827	887	804	
December	939	922	1,021	961	984	891	
Average First 4 Months	822	895	863	860	832	874	827
Average Last 8 Months	892	826	895	871	954	882	
Average 12 Months	868	849	884	867		879	

* Casualties to employees on duty in train and train-service accidents only.

Source of Basic Data: Interstate Commerce Commission, Statement M-400.

CASUALTY RATE PER MILLION MAN-HOURS IN TRAIN OPERATION TO TRAIN AND ENGINE SERVICE EMPLOYEES

BY MONTH*, ALL UNITED STATES RAILROADS

1961 - 1966

Month	1961	1962	1963	Average 3 Years	1964	1965	1966
January	27.2	27.7	27.1	27.3	25.2	28.9	28.3
February	27.0	29.7	27.9	28.2	24.4	29.2	26.7
March	23.9	25.7	24.6	24.7	23.6	26.8	24.9
April	23.3	22.0	23.6	23.0	23.6	24.2	24.8
May	22.7	23.5	20.5	22.2	26.6	25.1	26.2
June	24.9	24.0	25.5	24.8	28.2	27.6	26.6
July	26.9	22.6	26.5	25.3	30.8	29.8	
August	27.3	24.7	27.0	26.3	29.4	30.5	
September	25.8	23.6	27.7	25.7	28.5	27.7	
October	26.6	25.4	25.6	25.9	28.7	27.6	
November	25.1	22.7	24.7	24.2	27.4	25.4	
December	27.2	27.1	29.2	27.8	29.6	27.7	
Average First 4 Months	25.4	26.3	25.8	25.8	24.2	27.3	26.2
Average Last 8 Months	25.8	24.2	25.8	25.3	28.7	27.7	
Average 12 Months	25.7	24.9	25.8	25.5		27.5	

* Casualties to employees on duty in train and train-service accidents only.

Source of Basic Data: Interstate Commerce Commission, Statements M-300 and M-400.

INTERVENORS' EXHIBIT NO. 58—Table.

INTERVENORS' EXHIBIT NO. 59—Table.

INTERVENORS' EXHIBIT NO. 60—Table

INTERVENORS' EXHIBIT NO. 61—Table

[Omitted from Appendix.]

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INTERVENORS' EXHIBIT NO. 62—Table.

Train Accidents, Arkansas and All Other States

	Number of Train Accidents	
Year	Arkansas	All Other States
1961	42	4,106
1962	48	4,330
1963	55	4,765
Average 1961-1963	49	4,400
1964	47	5,269
1965	56	5,911
Percentage Increase, 1965 over avg.	14.3%	34.3%

Source: Interstate Commerce Commission, Statement M-400.

INTERVENORS' EXHIBIT NO. 63—Table

Casualties in Rail-Highway Grade-Crossing Accidents
Arkansas and All Other States

	Number of Casualties	
Year	Arkansas	All Other States
1962	95	4,366
1963	109	4,753
2-Year average	102	4,560
1964	82	5,281
1965	91	5,270
Percentage Increase, 1965 over avg.	—10.8%	15.6%

Source: Interstate Commerce Commission, **Statement M-400.**

INTERVENORS' EXHIBIT NO. 64—Tables.

Selected Operating Statistics.

SELECTED OPERATING AVERAGES IN FREIGHT SERVICE

CLASS I LINE-HAUL RAILROADS

1921, 1926 and 1936 to 1965

Year	Miles Per Hour Actual	Miles Per Hour Index 1921=100	Freight Train Car-Miles Per Train-Mile Actual	Freight Train Car-Miles Per Train-Mile Index 1921=100	Gross Ton-Miles Per Train-Mile Actual	Gross Ton-Miles Per Train-Mile Index 1921=100	Revenue Ton-Miles Per Train-Mile Actual	Revenue Ton-Miles Per Train-Mile Index 1921=100
1921	11.55	100.0	38.4	100.0	1,433.4	100.0	578.2	100.0
1926	11.92	103.2	45.2	117.7	1,736.0	121.1	701.0	121.2
1936	15.83	137.1	46.5	121.1	1,843.9	128.6	697.5	120.6
1937	16.09	139.3	47.2	122.9	1,875.8	130.9	718.8	124.3
1938	16.56	143.4	47.8	124.5	1,868.5	130.4	686.8	118.8
1939	16.67	144.3	49.2	128.1	1,956.2	136.5	737.7	127.6
1940	16.66	144.2	50.3	131.0	2,019.3	140.9	774.6	134.0
1941	16.48	142.7	50.8	132.3	2,093.8	146.1	836.8	144.7
1942	15.76	136.5	52.2	135.9	2,240.8	156.3	957.3	165.6
1943	15.43	133.6	52.5	136.7	2,322.8	162.0	1,036.9	179.3
1944	15.69	135.8	53.4	139.1	2,373.4	165.6	1,055.1	182.5
1945	15.70	135.9	52.6	137.0	2,349.2	163.9	1,044.1	180.6
1946	16.03	138.8	52.2	135.9	2,305.5	160.8	1,002.7	173.4
1947	16.03	138.8	53.3	138.8	2,394.4	167.0	1,062.7	183.8
1948	16.16	139.9	54.8	142.7	2,462.7	171.8	1,091.1	188.7
1949	16.91	146.4	57.2	149.0	2,496.6	174.2	1,056.0	182.6
1950	16.83	145.7	58.8	153.1	2,628.5	183.4	1,142.9	197.7
1951	16.94	146.7	60.1	156.5	2,732.0	190.6	1,223.3	211.6
1952	17.61	152.5	61.9	161.2	2,804.6	195.7	1,222.4	211.4
1953	18.20	157.6	63.6	165.6	2,836.0	197.9	1,230.3	212.8
1954	18.72	162.1	65.4	170.3	2,871.2	200.3	1,288.4	212.5
1955	18.62	161.2	66.5	173.2	2,984.4	208.2	1,308.9	226.4
1956	18.59	161.0	67.5	175.8	3,060.3	213.5	1,360.7	235.3
1957	18.82	162.9	69.7	181.5	3,139.2	219.0	1,383.8	239.3
1958	19.15	165.8	71.1	185.2	3,168.1	221.0	1,377.7	238.3
1959	19.49	168.7	70.1	182.6	3,170.8	221.2	1,389.7	240.3
1960	19.53	169.1	70.7	184.1	3,221.6	224.8	1,415.0	244.7
1961	19.85	171.9	71.5	186.2	3,298.4	230.1	1,457.9	252.1
1962	20.02	173.3	71.6	186.5	3,371.1	235.2	1,507.2	260.7
1963	20.10	174.0	71.4	185.9	3,427.7	239.1	1,554.7	268.9
1964	20.08	173.9	70.8	184.4	3,454.6	241.0	1,589.1	274.8
1965	20.07	173.8	70.7	184.1	3,543.8	247.2	1,657.8	286.7

Source: Interstate Commerce Commission, Transport Statistics in the United States.

MOTOR-VEHICLE REGISTRATION

UNITED STATES AND ARKANSAS

1930 - 1964

Year	Number of Automobiles, Trucks, and Buses: United States *	Arkansas
1930	26,794,000	221,000
1940	32,525,000	261,000
1950	49,300,000	477,000
1955	62,875,000	584,000
1960	73,866,000	708,000
1964**	86,297,000	873,000

* Beginning 1960, includes Alaska.

** Preliminary.

Source: United States Department of Commerce, Statistical Abstract of the United States, 1965, Table No. 798.

INTERVENORS' EXHIBIT NO. 65—Tables.

[Omitted in Appendix.]

INTERVENORS' EXHIBIT NO. 66—Tables.

Statistical Tables Related to Testimony of Witness D. E. Farrar, Kansas City Southern Railway

Kansas City Southern Railway Co. Total Enginemen Expense (Account 392) in Arkansas Per Freight Train-Mile

1962-1965

Year	Enginemen Expense[1]	Freight Train-Miles[2]	Enginemen Expense Per Mile
1962	$232,586	297,390	$0.782
1963	242,791	296,270	.819
1964	275,265	306,152	.889
1965	222,921	291,121	.766

[1] Exhibit D to Statement of D. E. Farrar, work sheet 4A, line 38.

[2] Exhibit D to Statement of D. E. Farrar, work sheet 3, line 1.

Kansas City Southern Railway Co. Total Trainmen Expense (Account 401) in Arkansas Per Freight Train-Mile

1962-1965

Year	Trainmen Expense[1]	Freight Train-Miles[2]	Trainmen Expense Per Mile
1962	$296,098	297,390	$0.996
1963	326,573	296,270	1.102
1964	384,691	306,152	1.257
1965	338,155	291,121	1.162

[1] Exhibit D to Statement of D. E. Farrar, work sheet 2, line 29.

[2] Exhibit D to Statement of D. E. Farrar, work sheet 1, line 1.

Kansas City Southern Railway Company System Enginemen and Trainmen Cost Per Freight Train-Mile

1962-1965

Year	Wage Costs[1]	Freight Train-Miles[2]	Cost Per Freight Train-Mile
		Enginemen	
1962	$ 940,183	1,345,612	$0.699
1963	1,027,024	1,336,763	0.768
1964	1,140,071	1,417,477	0.804
1965	969,253	1,367,606	0.709
		Trainmen	
1962	1,339,927	1,345,612	0.996
1963	1,485,017	1,336,763	1.111
1964	1,730,301	1,417,477	1.221
1965	1,567,547	1,367,606	1.146

[1] Annual reports filed with the Interstate Commerce Commission, Schedule 320, 1962-1964, enginemen line 130. and trainmen line 138; 1965, enginemen line 128 and trainmen line 136.

[2] Annual reports filed with the Interstate Commerce Commission, Schedule 531, Item No. 6, Column (b).

Kansas City Southern Railway Company Ratios of Cost Per Freight Train-Mile Operations in Arkansas to System Operations

1962-1965

Year	Cost Per Freight Train-Mile Arkansas[1]	Cost Per Freight Train-Mile System[2]	Ratio, Arkansas to System
	Enginemen		
1962	$0.782	$0.699	1.119
1963	0.819	0.768	1.066
1964	0.899	0.804	1.118
1965	0.766	0.709	1.080
	Trainmen		
1962	0.996	0.996	1.000
1963	1.102	1.111	.992
1964	1.257	1.221	1.029
1965	1.162	1.146	1.014

[1] Enginemen Table, P. 1 and Trainmen Table, P. 2.

[2] System data from Table, P. 3.

Kansas City Southern Railway Company Operating Expense for Freight Enginemen (Account #392)

1962 to 1965

Year	System Total[1]	Arkansas[2]	Per cent Arkansas of Total
1962	$ 940,183	$232,586	24.7%
1963	1,027,024	242,791	23.6
1964	1,140,071	275,265	24.1
1965	969,253	222,921	23.0

[1] Annual Report of Kansas City Southern Railway Company to Interstate Commerce Commission, Schedule 320, Column (c), 1962, 1963 and 1964, line 130, 1965 line 128.

[2] Exhibit D to Statement of D. E. Farrar, Work Sheet 4A, line 38.

Kansas City Southern Railway Company Operating Expense for Freight Trainmen (Account #401)

1962-1965

Year	System Total[1]	Arkansas[2]	Per cent Arkansas of Total
1962	$1,339,927	$296,098	22.1%
1963	1,485,017	326,573	22.0
1964	1,730,301	384,691	22.2
1965	1,567,547	338,155	21.6

[1] Annual Report of Kansas City Southern Railway Company to Interstate Commerce Commission, Schedule 320, Column (c), 1962, 1963 and 1964, line 138; 1965 line 136.

[2] Exhibit D to Statement of D. E. Farrar, Work Sheet 2, line 29.

INTERVENORS' EXHIBIT NO. 67—
Senate Hearing Excerpts

[Omitted from Appendix.]

In the
United States District Court,
Western District of Arkansas,
Hot Springs Division.

Civil Action No. 944.

Chicago, Rock Island and Pacific Railroad Company, The Kansas City Southern Railway Company, Missouri Pacific Railroad Company, St. Louis-San Francisco Railway Company, St. Louis Southwestern Railway Company, and The Texas and Pacific Railway Company ... .Plaintiffs,

v.

Robert N. Hardin, Prosecuting Attorney for the Seventh Judicial Circuit of Arkansas, and W. F. Denman, Jr., Prosecuting Attorney for the Eighth Judicial Circuit of Arkansas ....Defendants,

and

Brotherhood of Locomotive Engineers, Brotherhood of Locomotive Firemen and Enginemen, Brotherhood of Railroad Trainmen, Order of Railway Conductors and Brakemen, and Switchmen's Union of North America.. ......Intervenors.

Before Van Oosterhout, Circuit Judge, and Miller and Henley, District Judges.

J. Smith Henley, District Judge.

Memorandum Opinion.

By this suit in equity interstate rail carriers operating in and through Arkansas challenge once again the consti-

tutional validity of two Arkansas statutes prescribing minimum crew consists for freight trains in road and yard service. The two statutes are Act 116 of 1907, Ark. Stats., Ann., §§ 73-720 et seq. and Act 67 of 1913, Ark. Stats., Ann., §§ 73-726 et seq. Plaintiffs seek a declaration that the statutes are violative of the Due Process and Equal Protection Clauses of the 14th Amendment to the Constitution of the United States and of the Commerce Clause itself, U. S. Constitution, Art. I, section 8, Clause 3, and they seek an injunction against continued enforcement of the statutes. The defendants are two Arkansas Prosecuting Attorneys; five railroad Brotherhoods representing certain classifications of railroad employees have been permitted to intervene and to align themselves with the defendants. The case has been heard by a District Court of three judges, and this opinion incorporates the Court's findings of fact and conclusions of law.

The suit, filed in April 1964, seems to have been inspired by developments in the railroad industry in the last thirty or so years and by the fact that in 1963, to avert a threatened national strike of railroad workers, Congress adopted the Joint Resolution of August 28, 1963, P. L. 88-108, 77 Stat. 129, which provided in substance that the serious dispute between the rail carriers and the Brotherhoods about crew consists should be resolved by arbitration with the award to be binding for a period of not more than two years. Pursuant to that Resolution there was created Arbitration Board No. 282 made up of representatives of railroad management, the Brotherhood, and the public. In November 1963 that Board made a basic award to go into effect in 1964 and to expire in November 1965; that award permitted the carriers to make substantial reductions in consists of crews both in road and yard service.

In their original complaint plaintiffs alleged, in addition to their constitutional contentions, that the passage

of P. L. 88-108 and the award of Arbitration Board No. 282 amounted to a federal pre-emption of the field of crew consists.

In the fall of 1964 plaintiffs filed a motion for summary judgment based in part on the pre-emption contention. A majority of this Court sustained the motion on that ground without reaching the constitutional questions posed by the complaint. Chicago, R. I. & P. R. Co. v. Hardin, W. D. Ark., 239 F. Supp. 1.

Defendants in intervenors appealed to the Supreme Court of the United States, and the judgment of this Court was stayed about three weeks after it was entered. The Supreme Court reversed our decision and remanded the case for consideration of the constitutional questions on the merits, Brotherhood of Railroad Locomotive Engineers v. Hardin, 382 U. S. 423.

Act 116 provides in substance that all freight trains in road service operated on railroads fifty miles or more in length and consisting of twenty-five cars or more must be manned by a crew consisting of not less than one engineer, one fireman, one conductor, and three brakemen. Act 67 provides that railroads one hundred miles or more in length conducting switching operations over public crossings in first and second class cities in Arkansas must utilize crews consisting of not less than one engineer, one fireman, one foreman, and three helpers. Substantial pecuniary penalties are prescribed for violations of the respective statutes.

When those statutes were passed, all locomotives were powered by steam. In those days engineers, conductors, foremen, and firemen were indispensable crew members in road and switching operations. Hence, the practical effect of the statutes was to require the affected railroads to employ an "extra brakeman" and an "extra helper", depending upon the nature of the operation.

Over a period beginning in 1907 and ending in 1933 different rail carriers on three occasions attacked the validity of the statutes without success. Claims that the enactments violated the 14th Amendment, the Commerce Clause, the Interstate Commeree Act, and the Railway Labor Act were successively rejected. Chicago, Rock Island & P. R. Co. v. State, 86 Ark. 412, 111 S. W. 456, aff'd 219 U. S. 543; St. Louis, I. M. & S. R. Co. v. State, 114 Ark. 486, 170 S. W. 580, aff'd 240 U. S. 518; Missouri Pacific R. Co. v. Norwood, W. D. Ark., 42 F. 2d 765, aff'd but with leave to amend complaint, 283 U. S. 249, 283 U. S. 809, decided on merits, 13 F. Supp. 24, aff'd per curiam, 290 U. S. 600.

In that series of cases the statutes were authoritatively characterized as safety measures and were upheld as such. While the Courts recognized that the relationship and significance to safety of operations of fixed crew consists were questionable, the Courts on the records before them were not able to say that the statutory requirements were not reasonable and permissible police regulations.

In the Norwood case in particular the plaintiff carrier contended that changes in railroad equipment and operations in the years which had followed the adoption of the statutes had been such as to deprive them of their validity, and that they should be declared unconstitutional on the basis of changed conditions. In its decision on the merits, 13 F. Supp. 24, the District Court recognized that there had been many material changes in the railroad industry, and it discussed them in great detail. However, the Court was not persuaded that the changes had been so great or significant as to render unconstitutional the continued enforcement of the statutes. And in its affirming per curiam opinion the Supreme Court "saw no reason to disagree with the determinations of fact reached by the District Court." 290 U. S. 600.

In the instant case plaintiffs now contend that changes in the industry which have taken place since Norwood have rendered the statutes obsolete and irrelevant as far as railroad safety is concerned, and that if they did not do so before, the statutes now amount to violations of the Due Process and Equal Protection Clauses, and that they discriminate against interstate commerce and are an unconstitutional burden of that commerce.

Countering those contentions the defendants and intervenors, while admitting that there have been changes and improvements relevant to safety of operations, deny that those changes have been as far reaching and significant as plaintiffs contend, and deny that the improvements have been universally and uniformly adopted by the carriers; they also contend that railroad operations today present hazards that did not exist when Norwood and the other earlier cases were decided; and they challenge the cost figures of the carriers. They say that even after giving full weight to the changes and improvements the question of the reasonableness of the statutes as safety measures still remains fairly debatable and that this Court should not substitute its judgment for the judgment of the Arkansas Legislature.[1]

Alternatively, defendants and intervenors contend that even if the statutes have lost their significance as safety measures, they are still sustainable as "economic legislation," and they cite in that connection a line of cases beginning with West Coast Hotel Co. v. Parrish, 300 U. S. 379, and apparently ending with Joseph E. Seagram & Sons, Inc. v. Hostetter, 384 U. S. 35. We dispose of this alternative contention at this point by observing that the statutes have been characterized as safety measures and nothing else. We accept the characterization of the earlier

[1] Defendants and intervenors point out that in 1958 the people of Arkansas voted on a referendum petition directed at the statutes and refused to adopt.

decisions and find it unnecessary to decide whether the statutes are sustainable on some other basis.[2]

As has been seen, the Arkansas statutes have been upheld by the Supreme Court of the United States, with the Norwood litigation being terminated finally in 1933. In view of the judicial history of the statutes, it is necessary for us to determine what issues are open to us here and to what extent our inquiries are foreclosed by the earlier adjudications. The plaintiffs say that all issues are open for consideration in the light of changed conditions. Defendants and intervenors say that all issues are foreclosed, except the contention based on the Due Process Clause.

In connection with their appeal from our order granting summary judgment in the case, defendants and intervenors argued in the Supreme Court that the constitutional issues tendered by plaintiffs are insubstantial. That Court rejected that contention. We have read the opinion of the Court very carefully and are persuaded that no issues raised by the pleadings and the evidence are "foreclosed" by the earlier decisions. While we consider the issues against the backdrop of the former cases, we must consider them in the light of present day conditions and in the light of the additional experience with and insights into crew consists in relation to safety of operations which have been gained in the thirty-four years which have elapsed since *Norwood* was finally decided.

As materials of record reflect, the proper manning of freight trains has been a source of controversy between the carriers and the Brotherhoods for many years, and the problem has become one of increasing urgency as time has gone by. It has been the subject of collective

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[2] It may be doubted that the statutes could be sustained under the Arkansas Constitution as "economic measures", but we do not pursue that subject.

bargaining, of studies by representative groups, of legislation and of arbitration. Naturally, as the transportation industry has become more efficient and competitive, and as equipment and technology have improved, the carriers have sought to operate without unnecessary personnel. Equally naturally, the great railroad Brotherhoods have sought to protect insofar as possible the jobs of their members. Generally, the railroads have desired to reduce crews in road and yard services, and particularly to eliminate firemen on diesel locomotives, which have now universally supplanted steam power, and to eliminate the third brakeman and third helper. The Brotherhoods, on the other hand, have desired to maintain existing crew levels or even, in instances, to increase them.

As time has gone by, there have been many historical developments in the railroad industry related to the problem of freight and switching crew consists. Bargaining has taken place, demands and counter-demands have been made, strikes have been threatened, studies and reports have been made, and there have been arbitration awards under which the carriers and the Brotherhoods have operated for substantial periods of time.

It would prolong this opinion unduly and would be a duplication of effort to undertake to outline those historical developments here in any detail. Adequate historical statements will be found in the opinion of the Supreme Court in this case in the 1960 Report of the Public Service Commission of the State of New York dealing with the full crew laws of that State; in the 1962 Report of the Presidential Commission on Railroads; and in the Report of the Royal Commission on Employment of Firemen on Diesel Locomotives in Freight and Yard Service on the Canadian Pacific Railway. Regardless of the validity of the opinions expressed and the conclusions reached in those reports, there can be no question that

most of the factual material set out in them is accurate. Indeed, many of the facts set forth in the reports could be the subject of judicial notice.

As pointed out in the report of the Presidential Commission, full crew legislation was the product of the late 19th and early 20th century; with a few exceptions no full crew legislation has been passed since 1920. As of January 1, 1967, fifteen States, including Arkansas, had full crew legislation with respect to passenger trains.[3] Six States besides Arkansas had full crew requirements of some sort for freight trains in road service. Four States in addition to Arkansas had similar requirements for switching crews. Seven States have authorized their regulatory agencies to make full crew requirements, but in four of those States no requirements have been made. Twenty-seven States have neither legislated on the subject nor authorized consist requirements to be made by regulatory bodies.

The Arkansas requirement that six man crews be employed in all road and switching operations is the most arduous of all of the existing full crew requirements. Of the other full crew States only Indiana requires the employment of as many as six men, and Indiana's requirement is limited to longer trains.

All of the plaintiffs here are Class I railroads. All of them employ diesel-electric locomotives in their operations; none uses steam power. All of the plaintiffs are subject to both of the Arkansas statutes.[4] In none of the States bordering Arkansas are there full crew requirements which affect plaintiffs, and in all of those border-

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[3] The Arkansas statute relating to the crews of passenger trains, Ark. Stats., Ann., §§ 73-723 and 73-724, is not involved in this litigation.

[4] In the course of the oral argument counsel for the carriers expressly waived any contention that the Arkansas Statutes do not require firemen on diesel locomotives.

ing States plaintiffs operate with crews of less than six men.

There are seventeen short line carriers in Arkansas which are not affected by the statutes. Their crew consists are determined by managerial decision or by collective bargaining. They operate with varying crews of from two to six men. There are also industrial and military railroads in the State which operate with crews of less than six. The tracks of the short line carriers, of the industrial railroads, and of the military railroads connect with the interstate lines of one or more of the plaintiffs, and the same equipment which moves on the long lines moves on the short ones.

With the foregoing by way of background, we approach now the merits of the controversy. The governing legal principles are clear and, indeed, are not substantially disputed:

In the absence of controlling federal enactments, the State of Arkansas is free, subject to the limitations of the Commerce Clause, the Due Process Clause, and the Equal Protection Clause, in the exercise of its police power to legislate in the interest of safety of railroad operations even though its legislation may affect interstate commerce.

As far as the Due Process Clause is concerned, the statutes are not unconstitutional if their requirements are reasonably related to safety of operations, and if they are not unduly oppressive, restrictive, or costly in comparison with the safety benefits achieved. See, in addition to the cases involving the Arkansas statutes: Goldblatt v. Town of Hempstead, 369 U. S. 590, 594-595; Lawton v. Steele, 152 U. S. 133, 137; Weinberg v. Northern Pacific Ry. Co., 8 Cir., 150 F. 2d 645.

If the reasonableness of the requirements of the statutes remains fairly debatable, this Court will not substitute its views for those of the Legislature; we do not sit to

exercise "legislative judgment". United States v. Carolene Products Co., 304 U. S. 144; South Carolina State Highway Commission v. Barnwell Brothers, Inc., 303 U. S. 177; Standard Oil Co. v. City of Marysville, 279 U. S. 582; Weinberg v. Northern Pacific R. Co., supra.

As to the Commerce Clause, it goes without saying that Arkansas may not lawfully discriminate against interstate commerce, nor may the State unreasonably burden that commerce. With respect to the burdening of interstate commerce it should be pointed out that the Commerce Clause and the Due Process Clause are not exactly co-extensive. A State regulatory statute which may survive a due process attack may fall before the Commerce Clause. Bibb v. Navajo Freight Lines, 359 U. S. 520, 529.

In the absence of ruling federal legislation or regulatory action, a State is free to adopt local safety legislation which may affect interstate commerce, provided that the enactment serves a real and legitimate purpose and is not unduly burdensome on that commerce. But, the general rule is that State regulation which interferes with the free flow of interstate commerce or which materially affects it in areas where uniformity of regulation is required, is invalid under the Commerce Clause. Morgan v. Virginia, 328 U. S. 373, Southern Pacific Co. v. Arizona, 325 U. S. 761.

At times, a State safety statute may have a distinct impact on interstate commerce, and when such a situation arises, there must be a judicial balancing of the legitimate State interest against the national interest in the flow of interstate commerce free from local regulation. Bibb v. Navajo Freight Lines, supra; Southern Pacific Co. v. Arizona, supra.

The Arkansas statutes are presumed to be valid as against both the 14th Amendment and Commerce Clause attacks. Bibb v. Navajo Freight Lines, supra, 359 U. S.

at 529. The burden is upon the plaintiffs to establish the invalidity of the statutes, and if upon a consideration of the whole record a reasonable doubt upon the question remains, that doubt must be resolved in favor of the validity of the statutes.

The record before us is extremely voluminous. It includes oral testimony, sworn statements, depositions, statistical material, documentary evidence, copies of various public documents, photographs, and motion picture film. We make no effort to discuss the evidence in detail. If the mass of material put into the record by the parties, and we suspect that much that was put in is surplusage, is to be evaluated properly, it is necessary for us to define clearly the controlling issue before us.

That issue is whether under present railroad operating conditions the minimum six man crew requirements of the two Arkansas full crew statutes remain as valid exercises of the State's police power in the field of railroad safety or whether they now amount to arbitrary requirements which are unreasonable, oppressive and unduly burdensome on interstate commerce.[5]

It is important to keep in mind that we are concerned with the specific consist requirements which Arkansas has seen fit to make. We are not directly concerned with the requirements of the other full crew States, and we are not concerned with other requirements which the Arkansas Legislature might have made had it chosen to do so.

We are dealing here with railroad safety, and in the field of railroading "safety" is a highly relative term. Pennsylvania R. Co. v. Driscoll, Pa., 9 A. 2d 621. Railroading is an inherently dangerous business whether it is car-

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[5] The view which we take of the case renders it unnecessary for us to consider whether the statutes "discriminate against interstate commerce" or whether they violate the Equal Protection Clause.

ried on in Arkansas, Missouri, New York, or California. As long as railroads operate and as long as human beings are fallible, there are going to be railroad accidents. There are many causes of such accidents. Some types of accidents may be connected proximately to railroad crew consists; many other types cannot be so connected. A railroad hazard which cannot be avoided or mitigated by having a particular number of men on a train or in a switching crew, is not relevant in this case. On the other hand, it is only fair to say that an improvement in railroad equipment or operating methods which does not eliminate or substantially eliminate the need for one or more men to perform a necessary safety function is equally irrelevant. Speed and efficiency of railroad operations cannot be equated entirely with safety of operations; however, it cannot be said accurately that safety of operations may not frequently be related to efficiency and speed of operations.

There is no question that since the Norwood decision great changes and improvements in railroad equipment and operating methods have been made, which changes and improvements have contributed largely to safety of operations.

The diesel locomotive has entirely displaced steam power, and the design and appearance of a diesel locomotive differ greatly from those of a steam locomotive. A diesel locomotive is a much more efficient piece of machinery than a steam locomotive, and is so designed and arranged as to require much less human effort in servicing the locomotive and making adjustments while the train is in motion. Almost all necessary adjustments that can be made while the locomotive is in operation are made by manipulating switches and buttons.

There have been great improvements in cars, couplers, brakes, tracks, roadbeds, and switches. There have been new and improved signals and traffic control devices de-

signed and installed. Communications from one end of a freight train to the other and from the train to points outside the train have been revolutionized by the development of the two-way radio telephone. There are others which might be mentioned. Operating methods have changed also so that the duties of crew members are less arduous than they were thirty years ago.

The diesel locomotive began to be used in road service in the 1930's and its adoption progressed steadily in the post Norwood years, except to the extent that it may have been slowed down temporarily during World War II.

Prior to 1937 some carriers used firemen on diesel locomotives; others did not. In that year the Brotherhood of Locomotive Firemen and Enginemen and the carriers entered into an agreement known as the 1937 National Diesel Agreement which in general retained firemen on diesel locomotives in freight and yard service as well as on passenger trains. That agreement remained the basic rule in the industry as far as firemen were concerned until the award of Arbitration Board No. 282 went into effect.

While, as stated, the employment of firemen was governed for many years by the 1937 agreement, there was no "national rule", as far as brakemen and helpers were concerned. Depending upon local rules and practices the numbers of such employees varied from time to time and from place to place.

Between 1937 and 1959 in States not having full crew laws the carriers operated under the terms of the 1937 National Diesel Agreement and the particular rules and practices governing the numbers of brakemen and helpers to be utilized. This meant that during that period many, if not most, operations were being conducted with five man crews, and some operations were being carried out with crews of less than five men.

By 1959 the carriers had come to the conclusion that the retention of firemen in diesel service was unnecessary from any standpoint, including that of safety. The carriers had also concluded that as far as brakemen and helpers were concerned, fixed crew consists should be eliminated. The general position of the carriers was that overall crew consists should be determined by managerial decision, and that proper decisions would be prompted by the carriers' own enlightened self interest.

When the carriers put forward their proposals, the Brotherhoods countered with demands that the firemen be retained; that in road service there should be not less than two brakemen; that in yard service there should be not less than two helpers; and that such additional brakemen and helpers should be employed as to insure maximum safety of operations. We think that the counter proposals of the Brotherhoods as to brakemen and helpers are not without significance in this case.

In 1960 the Public Service Commission of the State of New York on the basis of studies and hearings determined that the New York full crew law, which was not dissimilar to those of Arkansas, was not any longer making any significant contribution to railroad safety and recommended that it be repealed. It was repealed effective in June 1966, except that New York still requires firemen to be retained on locomotives.

In 1962 the Presidential Commission on Railroads recommended subject to certain qualifications that firemen be discontinued in road and yard service and that the numbers of brakemen and helpers to be employed should be determined by collective bargaining and arbitration. The carriers and Brotherhoods involved in this case participated in the proceedings before the Commission.

The award of Arbitration Board No. 282 permitted the discontinuance of firemen on 90 percent of diesel

crews and gave to the BLF&E the right to determine the remaining 10 percent of the crews on which firemen were to be retained. As to brakemen and helpers the award provided in substance that the numbers of such employees should be determined ad hoc by special boards of adjustment in the light of certain guidelines spelled out in the basic award.

Following the award, freight and switching crews were reduced substantially which in at least many instances meant that road and switching operations were conducted with crews of less than five men. The award itself has now expired. As the Court understands the existing situation, the carriers are not free, in the absence of appropriate collective bargaining, to continue to reduce crew consists; on the other hand, they are not required automatically to restore positions which were eliminated while the award was in force. See Brotherhood of Railroad Trainmen v. Akron & B. H. R. R., C. A. D. C., ... F. 2d ..., opinion supplemented, ... F. 2d ....

The statistical evidence as to the effect upon safety of the reductions in force authorized by the basic award and by the awards of the special adjustment boards is not entirely satisfactory either way; statistical evidence seldom is. The statistics do indicate that in 1964, 1965, and 1966 railroad accidents of various kinds increased, but that casualties resulting from railroad accidents fell. However, both trends are to be observed in years preceding the effective date of the award. From the whole evidence in the case, it appears to us that the reductions in force had no substantial effect on safety of operations, except to the extent that there were fewer railroad employees on duty to be hurt. Why accident rates have been increasing we do not know with certainty, but it would be pure speculation to say that crew size has had anything to do with it.

We have undertaken to consider all of the evidence in the case including the reports and awards which have been mentioned. As to the reports and awards, we are not bound by them, but we think that we are entitled to consider them. The Commission and tribunals are, we think, entitled to some credit for expertness in the field; further, the reports and awards grew out of proceedings in which the plaintiffs and intervenors in this case participated, and the underlying issue about crew consists is the same as the issue here.

We find from the overwhelming weight of the evidence that by the mid 1950's, if not before, the fireman on a diesel locomotive and the third brakeman or helper had, in general, ceased to perform significant safety functions in the operation and switching of freight trains and cars. We further find that without regard to employee categories freight trains have been operated and switched throughout the country for the past number of years with crews of five men or less, and that the operations have been conducted with safety. It follows automatically that such operations can be conducted safely with less than six men.

What has been said about the country as a whole is clearly applicable to Arkansas. Railroad operations in Arkansas are certainly no more dangerous than operations in other States having comparable terrain, population, and economies. Indeed, it well may be that operations in Arkansas are safer inherently than operations in some of the bordering States which contain more densely populated and more urbanized and industrialized sections.

The foregoing statement about Arkansas is corroborated at least up to a point by the fact that the short lines operating in this State seem to have had no safety problems resulting from the fact that they use crews substantially smaller than those called for by the statutes. While

we are not prepared to accept wholeheartedly the contention of plaintiffs that there is "no difference" from the standpoint of safety in long line operations and short line operations, certainly the two operations resemble each other in the sense that both use and switch the same equipment, that the employees of both perform the same individual tasks in the same way, and that there are hazards common to both long line and short line operations.

Compliance with the Arkansas statutes places upon the carriers substantial financial burdens and also burdens them otherwise. As to cost of compliance in money the carriers' evidence is to the effect that the cost now amounts to $7,600,000 per year and can be expected to go higher. That figure seems to represent the direct outlay of the carriers in compensating the firemen, the extra brakemen, and the extra helper. That direct outlay is subject to offsetting costs that would be incurred if the two extra crewmen were eliminated; the carriers have not taken those offsetting costs into account in reaching their $7,600,000 figure, but it seems clear that after all reasonable offsets are taken into account, the net cost of compliance will remain very heavy.

Compliance with the statutes also involves the taking up of additional men when plaintiffs' trains approach or enter Arkansas and the dropping of such men when the trains leave Arkansas. We doubt that this burden is as great as the carriers would make it, but it does involve some delays and tends to interfere with continuity of operations.

We have now reached the point of decision.

Conceding that as late as the Norwood decision the question of the reasonableness of the Arkansas full crew laws was "fairly debatable," we are convinced with the requisite degree of certainty that the question is not fairly

debatable today, and it is not made so by the fact that the Brotherhoods continue to debate it.

We find from the evidence as a whole that under present conditions continued enforcement of the statutes makes no significant contribution to railroad safety, and that the statutes as they operate today are unreasonable and oppressive, and that they violate the Due Process Clause and unconstitutionally burden interstate commerce.

That is not to say that freight and switching crew sizes are irrelevant to safety of operations. A train cannot be operated efficiently and safely or, indeed, at all, without a minimum crew consist, but we agree with plaintiffs that minimum crew consists vary with the facts and circumstances of particular railroad operations, and we hold that it is now unreasonable and arbitrary for Arkansas to require men for all operations in road service and urban switching without regard to surrounding facts and circumstances other than those set forth in the statutes.

It may be that in some exceptional circumstances a crew of six men or even more would be necessary for the safety of a particular train movement or switching operation, but the mere fact that an exceptional situation might dictate the use of a six man crew does not, in our estimation, justify the inflexible requirement of the Arkansas statutes that no less than six men always be used.

Even if we go one step further and indulge the very doubtful assumption that in all situations the very fact that three men, rather than two, are keeping a lookout, or that three men, rather than two men, are braking or switching, adds some increment of safety to the operation, we think that such an increment is negligible and speculative and not worth the cost.

With more specific regard to the contention of plaintiffs that the statutes unduly burden interstate commerce, we think that the financial burden of compliance, which

is out of all proportion to the benefit, if any, derived, and the added burden involved in the taking on and discharging men at or near the the Arkansas State line are sufficient to justify our conclusion that the statutes are unconstitutional burdens on commerce. We feel, however, that we should go somewhat further than that.

The Arkansas statutes were passed during a period in which the railroads were the undisputed masters of land transportation; they enjoyed a practical monopoly in that field. They competed, more or less, among themselves, but they had to compete with no other form of land transportation, and air transportation of passengers and freight had not come into existence.

Such is not the case today. As pointed out by the Presidential Commission, and as everyone knows, the railroads now compete with busses, trucks, pipelines, and airplanes. In Arkansas they will be competing in a few years at the most with barge transportation on the Arkansas River; they are already competing with such traffic on the Mississippi River and many of its tributaries both great and small.

Again as pointed out by the Commission, if the railroads are to meet this competition successfully, they must make efficient use of their resources and equipment and must be free to take advantage of improved technology and developments in the industry.

The Arkansas statutes in our view militate against that necessary efficiency and flexibility; they hamstring the carriers in the important field of labor relations, and impose upon them requirements not generally imposed throughout the country and not imposed in any of the States bordering Arkansas.

In the foregoing sense, as well as in the others mentioned, the statutes burden interstate commerce, and we think that the burden is undue and unconstitutional.

In holding the statutes unconstitutional we do not overlook the fact that a contrary result was reached in Public Service Commission of Indiana v. The New York Central Railroad Co., Ind., 216 N. E. 2d 716, decided in 1966, and in New York Central R. Co. v. Lefkowitz, 259 N. Y. S. 2d 76, decided in 1965, affirmed by the Appellate Division of the Supreme Court of New York on June 29, 1967. With due deference to those decisions and to the Courts rendering them, we come to the opposite conclusion.

Before bringing this opinion to a close we desire to point out that our decision does not prohibit the carriers from employing as many men as they may care to employ in road and yard service; it does not require them to discharge a single fireman, brakeman, or helper. It simply leaves plaintiffs free to work out their crew consist problems with the Brotherhoods by means of collective bargaining within the framework of the Railway Labor Act without their hands being tied by statutes which at best are functus officio as far as railroad safety is concerned.

A decree enjoining enforcement of the Act is being entered. Dated this 2nd day of October, 1967.

/s/ Martin D. Van Oosterhout,
United States Circuit Judge,

/s/ John E. Miller,
United States District Judge,

/s/ J. Smith Henley,
United States District Judge.

Decree.

Pursuant to Memorandum Opinion this day filed herein, it is by the Court Considered, Ordered, Adjudged, and Decreed:

1. That the so-called Arkansas Full Crew Laws, to-wit, Act 116 of 1907, Arkansas Statutes Annotated, § 73-720 et

seq., and Act 67 of 1913, Arkansas Statutes Annotated, § 73-726 et seq., be, and they hereby are, declared to be unconstitutional as violating the Due Process Clause of the 14th Amendment to the Constitution of the United States and as being an unconstitutional burden on interstate commerce prohibited by the Commerce Clause of the Constitution of the United States, United States Constitution, Article I, Section 8, Clause 3.

2. That the Prosecuting Attorneys of the Seventh and Eighth Judicial Circuits of Arkansas, their Assistants and Deputies, and the successors in office of the said Prosecuting Attorneys, and the Assistants and Deputies of said successors, be, and they hereby are, permanently enjoined and restrained from enforcing or taking any action to enforce said statutes or either of them against plaintiffs herein, to-wit, Chicago, Rock Island and Pacific Railroad Company, the Kansas City Southern Railway Company, Missouri Pacific Railroad Company, St. Louis-San Francisco Railway Company, St. Louis Southwestern Railway Company, and the Texas and Pacific Railway Company, or their assignees and successors.

3. That the intervention filed herein by the Brotherhood of Locomotive Engineers and certain other labor unions representing various classes of railroad employees be, and the same hereby is, dismissed.

4. That all parties hereto bear their own costs.

Dated this 2d day of October, 1967.

/s/ Martin D. Van Oosterhout,
United States Circuit Judge,

/s/ John E. Miller,
United States District Judge.

/s/ J. Smith Henley,
United States District Judge.

On October 9, 1967, the District Court denied Intervenors' and Defendants' Joint Motion to Suspend Injunction Pending Appeal.

On October 21, 1967, Mr. Justice White granted Intervenors' and Defendants' Joint Motion to stay execution and enforcement of the Decree of the District Court.

On October 31, 1967, Intervenors filed Notice of Appeal to the Supreme Court of the United States.

On December 26, 1967, Intervenors filed a Jurisdictional Statement.

On December 29, 1967, Defendants filed a Jurisdictional Statement.

On March 4, 1968, the Supreme Court of the United States took the following action: "In these cases probable jurisdiction is noted. The cases are consolidated and a total of one and one-half hours is allotted for oral argument. Mr. Justice Fortas took no part in the consideration or decision of these cases."
